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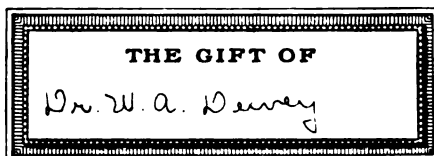
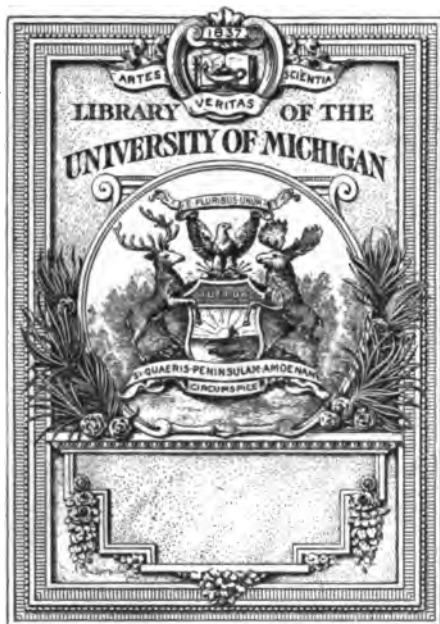
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# JOURNAL *of* Therapeutics *and* Dietetics

(MONTHLY)

ONE DOLLAR THE YEAR

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*Veritas Drachalebit*

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PITTS EDWIN HOWES, M.D.  
*Managing Editor*

VOLUME II  
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No. 1.

## COLLINSONIA CANADENSIS.

COLLINSONIA CANADENSIS, commonly called "stone-root," is one of our most useful remedies; when properly adjusted to conditions it is promptly curative. This drug belongs to the class which require the preparation to be made from the green plant. Many of the failures recorded concerning its use are due to the fact that this method of preparation has been ignored.

Collinsonia is particularly useful in some forms of sore throats. Those that are caused or increased by a constant and continual use of the voice, commonly known as "clergyman's sore throat," are invariably benefited by its use. This benefit will be *quickly* manifested in the acute cases. Its prolonged use will cure many obstinate chronic cases.

Many attacks of hemorrhoids, especially in the acute form, will be promptly relieved by this agent. In the puerperal condition, where this tendency is so liable to manifest itself, the administration of Collinsonia will bring prompt relief.

It will also be found valuable in many difficulties of the intestinal tract that are produced by irritation; it improves the appetite, increases the amount of the gastric juice, and imparts a decided tonic effect upon this part of the human economy.

Collinsonia is also one of our valuable heart remedies. It acts upon the tissues and valves of the heart by relieving irritation, increasing the power of its muscular action, and regulating the muscular contraction.

Foltz has found it beneficial in many conditions of the ear where there are increased secretions which are non-purulent in character. He also employs it in the early stage of middle ear disorders *when follicular pharyngitis* and *hypertrophied Luschka's glands* are complications. This remedy is also of use in many atonic conditions of the stomach, relieving irritation and causing better innervation. The *special indications* for its use are pointed out by Scudder as "a sense of constriction, with irritation in the throat, larynx, or anus; a sense of constriction, with tickling in the throat, with cough arising from use of the voice; a sensation as if a foreign body was lodged in the rectum, with contraction of sphincter and contracted and painful perineum; sticking pain in the larynx, heart, or bladder; contracted abdomen, vesical tenesmus."

Those most familiar with this remedy are the most enthusiastic in its praise. It only needs to be used to be appreciated.

# DEPARTMENT OF THERAPEUTICS

## BERBERIS AQUIFOLIUM.

BY A. WALDO FORBUSH, M.D., SOMERVILLE, MASS.

**BERBERIS AQUIFOLIUM**, — common name, mountain grape. Parts used, — root and berries. It is at all shrub and is a native of the western sections of the United States. *Berberis aquifolium* grows wild in high altitudes but it is cultivated in gardens on account of its beauty. The flowers are yellow, the berries dark colored and sour; the leaves resemble those of the holly.

Without further description of the botanical characteristics of the plant I wish to give the credit of its introduction into medicine to Dr. Bundy, of California, who, several years ago, wrote of its medicinal importance. In spite of this recommendation the remedy has been neglected.

There has not been, to my knowledge, a general proving of this drug, therefore I will give the result of an incomplete observation in three provings, in frequent doses of ten drops each to sixteen drams in twenty-four hours in each case.

*Effects on the head.* Dizzy sensation, pain on right side; pain in the temple extending to the teeth; a sore and sensitive feeling in the mouth with a burning deep in the eyes as if strained or from a severe head cold. In both cases there was a stuffy feeling of the nose followed with more or less discharge of thick, greenish-yellow mucus. *In the mouth*, we had a bilious taste, increased after eating, with a deeply coated yellow or brown tongue.

Tongue felt as if it was blistered. The expectoration was tenacious. There was soreness in the teeth of the lower maxillary and soreness and swelling of the salivary glands with a dry throat.

*Skin.* The skin was tinged yellow and was dry over the entire body with feverishness. Every attempt to raise the head caused a dizzy sensation and flashes of heat.

*Stomach.* Complained of hunger soon after eating; constantly hungry but with aversion to food. There were burning and cramp in the stomach with an uneasy feeling in the abdomen but without desire for stool. There was also a burning sensation in the region of the spleen, with some rectal disturbance.

*Stools.* Large, loose, hot, griping stool; third day, light colored stool, expelled with difficulty and much rectal disturbance.

*Urinary organs.* Increased action of the kidneys though the bowels



remained normal; the urine clear and without sediment, or urine of a sherry wine color.

*Generative organs.* Slight burning in the vagina, bearing down sensation, aching as if the menses were about to commence; delayed menses restored, in one subject; very decided increase of sexual desire and long continuance of the same; nervous, and restless.

The bilious symptoms were from the first very marked. The influence of the drug upon the entire glandular system, and the digestive and intestinal tract is steady and sure. The dyspeptic hunger without desire for food, with burning in the stomach was noticed from the first. The cramps in the stomach and "no appetite" occurred during the second week. Active diuresis increased in one and decreased in others.

*Chest.* Unusual weak feeling in the thorax; weakness of upper part of the chest with oppression, as of a weight; burning heat in lower left lung; voice very weak "as if a damper had been closed on it"; dry, nervous cough.

*Upper extremities.* Tremor in hands and arms; without ability or desire to raise the arms from the side; numbness and lameness of the arms.

*Lower extremities.* Heaviness and trembling of the limbs; lack of muscular power; difficult to lift the right foot; rheumatic tension and stiffness of the legs; cramps in the calves of both legs.

*Mental symptoms.* Unhappy and depressed most of the time; dullness of the mind; drowsiness; profound depression amounting to anguish; disinclination to move. While dull and stupid not sleepy.

The increase in the pulse was noticed in all the subjects. The mental symptoms appeared on the second day of proving, continued through and for days after. The symptoms in the extremities simulated rheumatism and paralysis. That form of paralysis arising from exposure to damp and cold, followed by numbness, immobility, and a kind of pain.

*Therapy.* *Berberis aquifolium* is classed among the decided alteratives. It also has antispasmodic qualities as well as those of a clean-cut tonic. Dr. Bundy recommended it in chronic malarial conditions. In domestic practice the fresh infusion, taken liberally, is regarded as a cure for chronic ague by our western neighbors.

It should be prescribed in glandular induration and chronic ulcerations, of a scrofulous or syphilitic type. In *syphilis* it greatly enhances the value of other vegetable alteratives and should be given with a free hand.

Single-handed it has cured obstinate chronic tonsillitis, chronic parotitis, and trachitis. It acts in complete harmony with *phytolacca*, *echinacea* and the iodides if the tincture or fluid extract is used.

In *incipient* phthisis it will enhance the open air and liberal diet treatment, by restoring gastric energy and so modify the tubercular tendency. Even when the mischief is considerable it will arrest its rapid course,

bring the pulse back to its normal standard, allay local irritation, and prolong life. It will do more for us here than creosote, phosphates, and all the agents so highly recommended, be they administered ever so judiciously.

In *chronic dyspeptic* conditions — chronic mucous maladies — due to disorders of the stomach, intestines, liver, and other glands, its tonic influence is quite noteworthy. It certainly acts as a tonic and corrective in wrong conditions of the liver, an influence that has been often observed when given for skin conditions. It can be combined with any indicated drug if desired.

There will never be a time when one remedy will cure everybody. If no two beings are created exactly alike how can we expect to treat all of them by one remedy or a cast-iron rule that ignores characteristics? - Thus the wise person looks sharply to drug indications and prescribes intelligently one or more strongly indicated remedies for the case in hand which are not to be discarded for something less specific. If science has not yet given the physician mastery over disease, what then? His art in the application of medicine must sustain him. Those in touch with advanced thought in current medical literature can plainly discern that the pendulum of progress now swings in an arc of specific and scientific therapy.

In bilious conditions with the "waxy look," like the beginning of jaundice, *berberis aquifolium* will prove curative. In all diseases of the spleen we have in this remedy a very positive action.

In *ozena* — non-malignant — even if accompanied with caries and involving the antrum, frontal sinus, and adjacent structure, with thick, gummy, tenacious secretions, in catarrhal diseases of the upper air passages attended by mucous outpourings, in diseases of the throat characterized by excessive discharge and a lowered vitality, *berberis aquifolium* has proved itself of great value.

*Berberis aquifolium* has now for some years had a merited reputation in nose and throat disorders attended by mucous outpourings and constitutional wrongs. Dr. J. P. Harbert gives an unqualified endorsement to its value as an adjunct to whatever local treatment he employs.

From my own observation, on general principles, I should recommend *yerba reuma* for local use in intractable forms of *ozena* and nasal catarrhs.

*Berberis aquifolium* is of special value in skin conditions of a non-inflammatory type, and yet it influences strongly some cases of the moist variety. No other single remedy will show better results in the removal of the eruptions that frequently appear about the face at the time of puberty, or later. It will also contribute very decidedly to the removal of the skin roughness, and promotes a clear complexion, a soft, natural, and moist skin when the cause is not a reflex one from ovarian or uterine irritation or menstrual wrongs. With attention to the diet and skin

hygiene, berberis has cured persistent acne when no local treatment was used.

A favorite formula in acne and other unhealthy conditions of the skin, pimples, pock-heads, and a greasy, pasty complexion of ladies and young people, is as follows:

R. Spec tinct. berberis aquifolium,	j to x gtts.
Spec tinct. rumex crispus,	x to xx gtts.
Fowler's Solution,	℥v gtts.

For each adult dose, four times a day.

Berberis aquifolium seems of especial value in scaly skin conditions. In eczema capitis, eczema genitalis, with pruritis, and in scaly eczema of all kinds this remedy has been given alone and has acted promptly and with good results. In *psoriasis* and in  *pityriasis* it has won merited favor from many practitioners. In many instances, various forms of chronic dermatitis have yielded to its influence when other treatments have failed.

In paralysis of the rectum, found in the aged with enfeebled condition, berberis aquifolium is the happy remedy and helps to a good reputation.

It is beneficial in rheumatism when the pain is like that from a blow, with lameness and stiffness, or when there is no pain except on movement, — the patient dreads to move on account of fear of pain. When desired, berberis aquifolium can be given with any other indicated remedy.

*Specific symptomatology.* This drug materially stimulates waste and repair; stimulates digestion and absorption, with special influence in scaly, pustular, and other skin conditions due to blood dyscrasia. It is a most reliable alterative when we desire to stimulate the glandular organs of the body. Its effect is not poisonous.

*Dosage.* This is a matter largely of individual opinion and judgment. The cumulative evidence in favor of a certain dosage is most useful if the same does not cause routinism which is most undesirable in practice.

Usual prescription:

R. Spec. tinct. berberis aquifolium,	3j
Aqua,	3iv
M Sig. 3j every two, three, or four hours.	
Luytie's tinct., x gtts., four times a day.	

---

“In thy thriving still misdoubt some evil;  
 Lest gaining gain on thee, and make thee dim  
 To all things else.  
 Gold thou mayst safely touch; but if it stick  
 Unto thy hands, it woundeth to the quick.”

— *George Herbert.*

**CHELIDONIUM MAJUS.**

BY J. M. FRENCH, M.D., MILFORD, MASS.

**CHELIDONIUM MAJUS** (common names, celandine, tetterwort, great celandine; natural order, papaveraceæ) is an evergreen perennial, indigenous to Europe but naturalized in North America. It grows along rocky and waste places, by roadsides and fences, and flowers from May to October. The stem reaches a height of from one to two feet, is branched, swelled at the joints, leafy, round, and smooth. The fresh plant contains a saffron-colored, milky juice, which has an unpleasant odor and an acrid taste. Its most important constituents are the alkaloids chelidonine, sanguinarine, chelerythrine, and protopine; also a yellow crystalline substance known as chelidoxanthin, and chelidonic acid. Besides these, there are a large number of less important constituents. No one or several of its constituents can be said to represent fully the medicinal activities of the plant.

*Properties and uses.* Applied externally, chelidonium is a local irritant. The fresh juice, when applied to the skin, produces inflammation and even vesication. It has long been known as a popular application for the cure of warts and corns, which it does by its caustic action; it is also used in indolent ulcers, fungosities, opacities of the cornea, and ringworm. As an application for the healing of wounds, used in the form of an alcoholic tincture, it is thought by some to be superior to arnica. It is also sometimes used externally in the form of a poultice or an ointment, as a remedy for scrofula, hemorrhoids, and some forms of skin diseases.

Internally, in moderate or large doses, it acts as a drastic purgative. Also, it is classed as alterative, diuretic, diaphoretic, and expectorant. It is not, however, commonly employed for any of these uses, for the reason that there are other agents which are superior for all of these purposes.

Its most important uses are as a remedy influencing those parts which are supplied with nerve force from the branches of the solar plexus, and with blood from the hepatic artery, and to some extent from the splenic artery. It is especially useful in diseases of the liver, such as acute and subacute inflammation, biliary catarrh, jaundice due to obstruction of the bile ducts, and biliary calculi. Ellingwood states that the conditions to which chelidonium are especially applicable are found in fully developed abdominal plethora, inefficient functional action of the glandular organs of the abdominal cavity, and imperfect, sluggish, and deficient circulation of the tissues, glands, and organs of this cavity. Its chief therapeutic applications are found in conditions resulting from sluggishness of the portal circulation. Felter and Lloyd give, as its specific indications, full, pale, sallow tongue and mucous membranes; skin pale and sallow, some-

times greenish; hepatic congestion; jaundice, due to swollen bile ducts; sluggish hepatic action; cough, with hepatic pain; fullness, with tensive or throbbing pain in the right hypochondrium, and pain extending to the right shoulder; melancholia, headaches, and gastric disorders dependent upon faulty action of the liver.

Ribbing and Reumpf used chelidoneine in gastric ulcer, cancer, and enteralgia, in doses of 2 to 5 cgm. The results were quite satisfactory, in some cases even excellent. Closely related to the poppy, one of its advantages over opiates is that it produces no traces of heaviness, somnolence, or constipation. It possesses calmative and hypnotic properties, while being less narcotic than the other alkaloids obtained from plants of the same family. Various authorities have made observations in the employment of chelidoneine in gastric cancer, cancerous affections of the lids and lips, epitheliomas, malign neoplasms, and all malignant tumors, external and internal. The results have been to a certain extent favorable, causing diminution in the size of the tumor, arrest of inflammation, and amelioration of all the symptoms. Notwithstanding all these facts, chelidonium has not attained any definite and well-established place as a remedy for cancer or cancerous affections.

Perhaps the strongest claim which has been put forward for chelidonium is in the treatment of biliary calculi, for which purpose it has been used for many years with eminent success by a large number of physicians of all schools. By many of these it is considered superior to any other remedy for this purpose. A physician of my acquaintance uses the specific tincture in doses of 15 minims, combined with variable proportions of chionanthus and dioscorea, and considers the combination superior to anything except surgical measures, and an excellent auxiliary thereto.

Perhaps the greatest need of chelidonium is for careful study, with a view of determining its precise indications. This work will have to be done mainly by the eclectic physicians of America. The results of their work will then be adopted by the so-called regular school. Whether they will give due credit or not, I will not undertake to say. But in any event, the remedy will be accepted, and its uses determined. A body of physicians who can bring about results of this character surely have a reason for existing and for not merging with the dominant school.

The dose of the plant is given as 5 to 30 gr.; of the fresh juice, 5 to 20 minims; of specific chelidonium,  $\frac{1}{8}$  to 10 minims. The dose of the alkaloids is not well determined, except in the case of sanguinarine, of which the dose varies from  $\frac{1}{12}$  to  $\frac{1}{2}$  gr., the former amount being expectorant and the latter emetic.

---

“If men lived like men indeed, these houses would be temples in which it would make us holy to be permitted to live.” — *John Ruskin*.

## VERONICA MINERAL WATER OF CALIFORNIA.

CONSIDERABLE credit is due Dr. Winslow Anderson for his efforts in bringing the mineral springs of California to the attention of the medical profession. His book on California waters \* established the first definite claims of the state as foremost in the United States in the variety, numbers, and value of medicinal springs, and this volume further furnished the material utilized by Crook,† in what must be accepted as the principal work on American waters. Since the publication of Anderson's work and that of Crook, the development of California springs has progressed rapidly until to-day that state offers not only the natural conditions, but hotels, baths, and resorts quite equal to any of those of the old world.

Among the California waters which have been adopted for use by the medical profession, none has been so thoroughly recognized throughout the United States, and in parts remote from California, as those from the springs near Santa Barbara, known as Veronica water. This is an alkaline-saline magnesian-sodic water, containing about 1,900 grains of mineral matter to gallon, of which magnesium sulphate is the principal salt.

*Classification and indications.* In a general way this water is to be classified with the so-called "bitter waters" of the Europeans, the action and therapeutic indications for which have been thoroughly studied and are fully understood. Primarily, this water is purgative, due to the action of the magnesium sulphate with its stimulating effect upon the secretions of the intestinal canal, its influence in liquefying fecal matter, and its pronounced stimulating effect upon the mucous membranes,‡ and, indirectly, this activity exerts its influence upon metabolism, inasmuch as the metamorphosis of fat is increased by stimulation of peristaltic activity. In addition to the sulphate salts, Veronica water contains sufficient alkaline carbonates to give their effect of increased diuresis.

In fact, the prime claim to be made for this water is based upon its general power of elimination, and the special indications may be surmised if this idea is borne in mind. In these conditions in which we desire long-continued stimulation of the intestinal tract, and especially when carbonated waters are contra-indicated on account of vascular weakness, this water may be taken over prolonged periods of time, in moderate doses, with great benefit. During pregnancy, in arteriosclerosis, and in valvular heart disease, it is far better than the carbonated laxative or purgative waters. In larger doses, the water is indicated in habitual constipation, or where rapid and copious discharge of the bowels is desired, as in hyperemia or stasis of the various visceral organs or membranes.

\* Winslow Anderson: "Mineral Springs of California," Bancroft Co., San Francisco.

† Crook: "The Mineral Waters of the United States," Lea Brothers & Co., New York.

‡ Solis-Cohen's "Physiologic Therapeutics," vol. ii, P. Blakiston's Son & Co., Philadelphia, Pa.

It is the European teaching that such waters should be used with care and discrimination in marked catarrhal conditions of stomach or intestines and in the presence of diarrhea.

The foregoing deductions are drawn from comparative study of Veronica with the well known spas of its class in Europe — Alap, Budapest, Puellna, Kissengen, and Friedrichshall. The clinical experience of American physicians has been sufficient in the use of Veronica, however, to provide a very considerable literature of that water itself.

*Clinical data.* Dr. R. Stansbury Sutton, of Pittsburg, late president of the American Academy of Medicine, states that it has been his custom during many years to give hot Veronica water to patients after abdominal section, beginning with tablespoonful doses as soon as the patient complains of thirst. The Veronica water relieves the thirst, dispels the accumulated gas, and hastens movement of the bowels without causing the slightest discomfort to the patient. At the time that he was president of the Pittsburg Gynecological Society and vice-president of the American Gynecological Association, Dr. Sutton held that, in his experience, Veronica water was far better adapted to the use of the operating gynecologist than any of the simple salines, being fully as effective and open to none of the objections which physicians and patients alike have found in the salines.

Equally competent medical authority is quoted in establishing the value of Veronica water in rheumatism, in the train of conditions following habitual alcoholic abuse, in sluggishness of the liver and impeded portal circulation, for the symptomatic relief of chronic nephritis, in constipation and the innumerable ills dependent upon faulty elimination, and in those affections of the urinary tract where mild diuresis with catharsis may be indicated.

One well-known physician advocates the water especially during pregnancy, if there is constipation or faulty elimination with threatened disturbance of the kidneys with possible uremia.

The experience of the writer's, extending over a considerable period of time, bears out the chief claims made for this water. The very thorough eliminating action,— the free, but not drastic catharsis,— the absence of objectionable taste of the water, and the positive effect upon digestive and urinary tract, indicate the value of Veronica water in this very broad if limited class of conditions.

In connection with Veronica water, it may be stated that, at one time, charges were made — presumably by prejudiced and interested persons — that Veronica was an artificial water. This was brought to the attention of the United States Government and an investigation was made. On June 8, 1899, in a signed statement, B. H. Thomas, representing the government as revenue agent, certified that the charges were entirely unfounded. Further, eight of the best known physicians of Santa Barbara

have certified that the water is not only a natural water but, in that locality, is looked upon as of peculiar and unusual value. — *The Chicago Clinic*.

### THERAPEUTIC NUGGETS.

**SODII CHLORIDUM IN INFANTILE DYSPEPSIA.** A small amount of this article added to the food of a mushing child will aid in making the child more plump and healthy, much to the pleasure of its mother.

**GUARANA IN HEADACHE.** When the headache is resultant from anemia, especially if there is mental depression and exhaustion, and pain is increased by moving about or noise, this remedy will prove beneficial. Dose: Guarana (spec. med.), gtts. xx; aqua,  $\mathfrak{z}\text{iv}$ . M. Sig.,  $\mathfrak{z}\text{j}$  every hour.

**CUPRI SULPHAS.** This drug has proved valuable in many cases of diarrhea and dysentery. Discharges that are bloody, accompanied with tenesmus and colicky pains, are among the best indications for its use. It may be prescribed in doses from  $\frac{3}{16}$  to  $\frac{1}{12}$  gr., *well diluted*, every two to four hours.

**SANGUINARIA CANADENSIS.** This is one of our most efficient cough remedies when properly indicated. Its most prominent indications are: tickling sensation in the throat, or irritation of the throat with cough; throat and air passages dry, hot, and swollen; respiratory diseases when the inspiration is difficult; sense of constriction in the throat with difficulty in deglutition.

**RHUS TOXICODENDRON.** In treating many acute ailments, particularly those of children, this remedy has an important place. Its special indications are: bright flushing of the surface; burning sensations, especially of the urinary and genital passages; pain in frontal regions, particularly if on the left side; pains in the lumbar and sacral regions, extending down the thighs, and accompanied by a sense of burning in the parts. It should be administered in small doses, —  $\frac{1}{2}$  to ii gtts., — as in large doses it is a powerful irritant.

**DROSER.** This is especially useful in spasmodic coughs. Those of whooping-cough and measles may serve as an example. The remedy must be prepared from the green plant to prove efficacious. The German tincture, the specific tincture, and the mother tincture are all reliable. The usual doses are: Ger. tinct., x to xl gtts.; spec. tinct., i to v gtts.; mother tinct., v to xx gtts. It should be frequently repeated in order to get the greatest benefit.



**PHYSICAL THERAPY.****\*ELECTRICITY AS A FACTOR IN THE TREATMENT OF DISEASES OF THE NERVOUS SYSTEM.**

BY FRANCIS B. BISHOP, M.D., WASHINGTON, D.C.

ELECTRICITY may be said to exercise its influence upon the body by its action upon protoplasm, either directly or indirectly modifying metabolism. Weak currents stimulate ameboid movement while strong currents cause the cells to assume a spherical form and to become motionless. The destructive metabolism of a cell is increased by its activity, but goes on also during quiescence. In protoplasm the two processes of waste and repair go on side by side, and as long as they are equal the size of the animal remains stationary. If, however, the building up exceed the waste the animal grows; if the waste exceed the repair the animal decays; and if decay go on beyond a certain point, life becomes impossible. It is an established fact that by its action directly upon the protoplasm of the nerves and muscles, the continuous current (interrupted) will cause to contract muscles when they will no longer respond to the normal volitional efferent impulse, or to the induced current. It is also a fact that the induced current will produce normally a more vigorous and prolonged contraction than the continuous current. It is equally true that when the motor neurons are cut off from their peripheral terminations, the anabolic action of the positive pole of the continuous current will produce contraction when neither the catabolic action of the negative pole or the induced current will produce such contraction. From long and careful observation I have been led to believe that the effects of the various currents upon the tissues of the body are those of anabolism, catabolism, and metabolism, according to the polarity, strength, and direction of the current used in relation to the tissues treated. In the physiological experiments upon the heart it has been shown in the electrical phenomena that during its contraction a distinct electrical change occurs, which is similar to that which happens in skeletal muscles with each contraction. It has been demonstrated that a stanuised frog heart undergoes two changes as regards its electrical condition; the first, immediately before the contraction, in which the excited part becomes negative to the other parts, contraction following the wave of excitation, and the second, during relaxation in which the current flows in an opposite direction. According to the views of Gaskell, the heart-muscle, as in protoplasm generally, the metabolic processes are those of anabolism, or building up, which takes

\* Read at the meeting of the New England Electro-Therapeutic Association, held at Boston, June, 1907.

place during the diastole of the heart, that vagus stimulation helps on this process, and of catabolism or discharge which is manifested in the contraction of the heart, and which is accelerated by stimulation of the sympathetic fibers; that vagus stimulation is therefore ultimately beneficial to the contractions. The electrical currents set up on the stimulation of the vagus and of the sympathetic are in opposite directions, and so, if Gaskell's contention is correct, that the negative variation of the muscle current occurring on sympathetic stimulation is a sign of catabolism. The result of vagus stimulation, viz., a positive variation of the muscle current, may be supposed to indicate the complementary condition of anabolism. (Kirk.)

According to the theory of Sir Oliver Lodge, all matter is electricity, varying in its density, vibration, and function according to the number of electrons in each atom, and that the electrons in the atom are always in a state of great activity and are held in the atom only by the attractive power of its positive ions. In the excited x-ray tube the cathode stream of electrical negative particles travels in an absolutely straight line from the negative pole to the target or anti-cathode at the rate of about 20,000 miles per second, while the positive particles or ions, which are much larger, travel more slowly, and creep, as it were, around the sides of the tube and up behind the cathode. This is not only the case with the vacuum tube but may be in a measure demonstrated between the discharging rods of a static machine in action. The white spark issuing from the negative pole, when discharging rods are separated from 6 to 8 inches, will travel straight for the positive pole, barring the deflection by atmospheric wave pressure, and surrounding objects. The white sparks from the negative side are composed of waves of the higher frequencies. While the colored sparks coming from the positive pole are composed of waves of the lower frequencies and seem to surround the white sparks and bulge out to come together cone-shaped at the sides of the negative sliding rod ball. This same law or principle should hold good in all currents, including nerve currents and muscle currents. This Lodge theory gives a new meaning and a new importance to the terms "positive" and "negative" as applied in electro-therapeutics. The fact that a normal motor nerve will react to the negative continuous current, applied anywhere along its trunk, and as a result of such reaction will perform its normal function of producing contraction in the muscles to which it is distributed, suggests, at least, that the same rate of vibration has been transmitted to the nerve by the battery current as is usually transmitted by the motor cells of the cerebral cortex through the volitional paths to the motor nerves. We can understand why muscles contract more vigorously as a rule under the influence of the induced current than under the continuous, for by its irritating qualities it contracts muscles largely by its influence on the superficial

sensory nerves; therefore we get a reflex action or stimulation through the afferent impulse being converted into a motor action, and when this is the case the contractions are usually more vigorous and prolonged than when due to direct motor stimulation; but why a degenerate muscle and nerve will often react more readily to the positive pole of the continuous current or, to put it more accurately, to the A.C.C. than to the C.C.C., has never to my knowledge been satisfactorily explained. One explanation is that the continuous current causes contraction in the muscle supplied by a degenerate nerve by its action directly upon the muscle protoplasm; but this does not explain why the positive pole has this action, frequently exclusively, as the negative pole of the continuous current will often fail to cause contractions in degeneration. One may assume, as an explanation, that when a muscle is cut off from its central nerve supply that it loses the stimulus that produces the negative electrical variation so necessary to normal muscular contraction, and in order that this negative variation may be induced the muscle must be subjected to a positive interrupted discharge of the continuous current. Again, assuming the electron theory to be correct, it may be that the motor nerve deprived for the time of the normal rate of vibration from its controlling neuron finds its vibration more in harmony with the slower and more widely distributed positive ions and consequently responds to the latter stimulus.

We know that degenerate nerves and muscles are more susceptible to the influence of the positive continuous current, and we have seen that the positive current or positive variation is associated with anabolism, and in this condition we need a great deal of anabolism and to avoid catabolism as far as possible. The positive stable current should be applied very mildly without the slightest interruption, as we must avoid contractions for a while, as contractions produce fatigue and fatigue is conducive to the destructive metabolism of the protoplasmic cell. As regeneration progresses, contractions may and, indeed, need to be produced very gently and for a short time only, at first with a period of perfect rest between each contraction.

In the treatment of degenerate muscles with the positive continuous current, we fill two important physiological requirements. A muscle in a state of complete and continuous relaxation is alkaline in reaction and is poorly supplied with oxygen.

The positive current attracts to its pole acids and oxygen, thus neutralizing the alkaline reaction of the muscle and bringing oxygen to aid in the building up of the muscle and nerve protoplasmic cells. The relaxed and alkaline muscle, being attacked by the closing or opening positive acid pole, may also account for the more ready reaction of the degenerate muscle to positive current.

The action of the electric current upon the pneumogastric nerve is a

subject worthy of the most profound study and careful experimentation. Under the influence of the very wide distribution of this nerve do we find the most important and vital organs of the body. Its stimulation will generally increase its inhibitory action upon the heart and will cause inspiration when the lungs are empty, as well as expiration when the lungs are full of air. It is a very important motor nerve of the stomach and intestines, its stimulation will cause gentle motion of these organs. It influences the action of the liver, the kidneys, and the spleen, but from the standpoint of our present knowledge the most important action in connection with electro-therapeutics is its anabolic action upon the heart muscle. It has been my good fortune to see a weak, diseased, and irregular heart in the person of an old lady over seventy years of age, go on functioning very comfortably for several years without the aid of drugs, by the careful electrical stimulation of the pneumogastrics, together with the peripheral stimulation and ozone inhalations from the static convective discharge. I have seen the tumultuous action of the heart in exophthalmic goiter quiet down and the beats regulated, not once, but time and again, by the proper stimulation of the pneumogastrics. Owing to its seemingly quicker action and more directly penetrating quality I have usually preferred the negative pole in the latter cases applied over the nerves; sometimes I have resorted to the interrupted direct current, very carefully watching its effects. The study of the various currents and their modifications upon the pneumogastrics alone could consume the working hours of a long life, and fill a very large volume. The sympathetic ganglia and nerves are much harder to reach and influence than the pneumogastrics, as they lie deeper in the neck and require more current to affect them, and less is really known as to the real value of their stimulation. But as their ganglion cells and axis-cylinders are composed of protoplasm, they must follow the same rules as to the effects of stimulation by the electric current as other protoplasms; but as they are catabolic in their action upon stimulation, and as they supply the muscles of the blood-vessels and of the viscera, we must be sure of the action we most desire, whether we wish to inhibit or accelerate their action, and then use the rule laid down. Weak currents stimulate the protoplasmic cells and increase their activity, while strong currents cause them to assume a spherical form and become motionless. The sympathetics may be reached through their ganglia in the neck, trying very carefully to avoid the pneumogastrics. They may be reached through the bowels and the dorsal spine, or through the bowel and epigastrium. Physiologists tell us, and indeed our daily observations confirm the statement, that one of the chief functions of nerve cells appears to be the power of sending out impulses to the periphery along efferent nerves in response to impulses reaching them through afferent nerves, and that an impulse passing to a nerve cell may produce such a change in its metabolism, that

a discharge of energy ensues, and as it passes out as an efferent impulse it produces a change in the peripheral end of the efferent nerves, which impulse may be that of motion, secretion, nutrition or vaso-motor.

To the electro-therapeutist this is most important knowledge. His applications must of necessity be topical, and through the impressions made upon the peripheral endings of the afferent nerves he can reach the centers controlling motion, secretion, nutrition, and the function of the vaso-motor nerves. A current applied to the back in the region of the kidneys will cause an increase in the secretion of urine, will dilate the peripheral blood vessels. If strong enough and interrupted, will cause contraction of the muscles of the back and a sense of burning under the sponge,—all due to a reflex stimulation of the nerve centers controlling this region, and a change in their metabolism.

Again, afferent impulses in acting upon the central neurons may produce inhibitory influences, and any center is susceptible to this action. It is through this action that we relieve a localized pain, a muscular spasm, or an excited heart. In relieving neuralgias, the same principle is involved. Gentle pressure applied to protoplasm increases its movements; therefore when a nerve is pressed on by inflammatory or other lesions, if it be a sensory nerve pain results, in a motor nerve spasm; but if the pressure is great and continuous, destructive metabolism takes place in the nerve and we have loss of sensation or paralysis of motion. Here we need the catabolic action of the negative continuous current, if the lesion can be located to destroy by cataphoric action or dissipate the lesion. In neuralgia, and in neuritis from toxic causes, after the toxic material has ceased its action, the pain will often continue, due to the metabolic change produced upon the protoplasm of the nerve cells. Here we need a current carefully regulated, whose rate of vibration will act in harmony with that of the normal nerve impulse; when this is reached, we may relieve the pain and by a repetition of this treatment at regular intervals, the nutrition of the neuron will be restored and the normal nerve current resumed. Pain or spasm may result from some central irritation of a toxic nature without producing neuritis; here the treatment will be the same, the object being to cause a normal reaction in the protoplasm of the central gray matter. In cases of localized numbness, where we can find no special cause and which is called tropho-neurosis, that may be due to congestion of the terminal filaments of the sensory nerves or spasms of the arterioles in the skin; in either event I have always believed these cases to be due to a toxic influence upon the nerve centers, inhibiting their normal action. Here the positive continuous current has given me the best results and follows the law that an electrical current flowing in the direction of a nerve current increases the action. As the negative current is the normal for motor nerve reaction, it seems to me that the positive is the normal for sensory

nerve reaction. This claim, I think, can be readily demonstrated upon the nerves of special sense.

In deep-seated neuralgias and neuritis the continuous current has been my sheet anchor. In neuritis of the superficial nerves I use the negative static oscillatory current from the negative side only (same law as above), the positive side being grounded and the vibrations graduated until the pain is lulled. I then think that my vibration is in harmony with the normal flow and that the central neurons are being aided in their effort to resume normal action. I allow this oscillatory current to pass until the patient is quite comfortable.

"From various considerations it is certain that pain is always the result of a change in the nerve cells of the brain."

Now, as nerve cells are protoplasm, and as the nerves are merely the continuations of the nerve cells, they are also protoplasm and must be subject to the law that governs the action of protoplasm under the influence of the electrical discharge; and as the activity of all matter is due to vibration and as the vibration is due (according to Lodge) to the number of electrons in each atom, and as these electrons are constantly in motion and kept within the atom only by the attractive power of the positive ions, one may readily conceive abnormal sensation to be due to a modification of the electrical equilibrium in the nerve cells or a lack of ionic control of the electrons; and normal sensation to be due to a more or less continuous flow of afferent impulses harmoniously blended; and when this harmony is disturbed, abnormal sensation results. It may be pain, it may be numbness, it may be itching, it may be formication, it may be a burning sensation.

In any event, barring traumatic or other lesions, we are liable to cure our patients if we can regulate our current in such a way as to send through these afferent nerves a vibration of such a character and rate as to create a nutritive action in the protoplasm of the cells of the brain and spinal cord. In some cases of organic lesions of the spinal cord where the condition of the patient seemed hopeless, I have, by the use of the electric current alone, favorably influenced the progress of the disease to such an extent as to render the patients comfortable and able to take care of themselves.

It has been pretty conclusively proven that all nerves are of the same anatomical construction and that they differ in their function only in consequence of the difference in function of their end organs, which for convenience we will call sensory and motor. The same is true of all battery currents whose conductors differ only in consequence of the difference in function of their poles, which for convenience we call positive and negative. Our electric conductors are insulated to prevent loss of current by contact with extraneous objects. The axis-cylinder, or conducting

material of each nerve, as it is continued from the neuron in the brain, the anterior cornea, and the posterior spinal ganglion, is carefully surrounded by its insulating material so that each nerve cell may transmit its own peculiar impulse to its destination without loss by contact with the surrounding tissue. So it seems that each and every central ganglion cell resembles a minute electric battery receiving from the periphery impressions which are interpreted by each end organ according to its function, and is transmitted as an impulse to sensory, motor or secretory, nutritive, or vasomotor. Is it not possible that these nerve impulses are really electrical, at any rate when the circuit is disturbed either in the cell or nerve fiber? Normal impulses are no longer possible; and in many instances the properly selected electric current, in consequence of its immediate action upon protoplasm, will do more to restore the perfect communication between center and periphery than at present, any known agent, provided, of course, there is not a decided break in the circuit in consequence of some inflammatory lesion, and even then, if the lesion can be located, the catalytic action of the current will often remove the lesion, unless it is of a destructive nature and has already destroyed tissue.

In functional disease of the nervous system, the general metabolic processes are sadly at fault. The chief seat of nervous metabolism is said to be in the axis-cylinder which is merely a continuation of the neuron substance. When the metabolism is disturbed, be it from too prolonged and strenuous mental labor, be it from the exhausting effects of acute disease, or from prolonged and improper diet, eating too much or too little, and from many other causes, serious functional nervous diseases are apt to be manifested. The metabolism of the brain cells is often disturbed in consequence of a blood supply, either insufficient in itself or insufficient in the amount of nourishment supplied to the protoplasm of the cell; or again the supply and nourishing quality may be sufficient but so charged with toxin as to modify and obtund the normal activity of the cells. The result of this impoverished metabolism may manifest itself in various ways,—in so-called neurasthenia, in lowered blood pressure, high blood pressure, with arteriosclerosis, in hysteria, and in many ways showing a general metabolic nerve cell disturbance. The Weir-Mitchell cure for neurasthenia may do very well for a small proportion of cases, but what is needed in all is a properly selected diet, and a treatment which will create by gentle reflex stimulation normal activity in these protoplasmic masses throughout the entire nervous system.

One method which in my hands has been very useful is the static current applied in the following manner: The patient is placed reclining upon a couch or operating chair and is attached to the appropriate side of a good static machine. The static canopy is lowered over him until, according to my judgment, he is in the midst of the electrostatic field, the

machine is started with sliding rods well separated. A pleasant breeze surrounds the patient, charged with ozone. This he is instructed to breathe, deeply and regularly. The entire body is brought in contact with a very high tension discharge, smoothly and pleasantly stimulating gently the entire surface of the body. This stimulation acting upon the end brushes and sensory corpuscles of the afferent nerves is transmitted to the ganglion cells in every portion of the body, while the ozone is rendered unirritating by its mixture with the atmospheric air, and we know that oxygen is immediately absorbed into the blood and is very necessary to the perfect metabolism of the tissues. I have cured many neurasthenics by this method, with the aid of other currents used for special reasons in different cases. It has been my pleasure lately to see one of my very dear friends relieved, not once, but many times, from a most intense gouty headache with high blood pressure, by an immersion for fifteen minutes at a time in this electrostatic field; and a treatment every day for about two months has placed him in a position to resume with interest his vocation, filled as it is with many cares and great responsibilities.

In conclusion, I wish to state that the claims made in this paper as to the action of electricity are founded upon physiological facts, and that I have borrowed freely from Kirk's "Physiology." Whether all or any of these claims will stand the test of time and further experience I do not pretend to say, but I do know that in electricity we have one of the most powerful agents for good when properly and carefully administered to suit the cases as they are presented; and, conversely, a most powerful agent for harm when incautiously and carelessly used; and that all real progress must be made upon the foundation of a carefully constructed electro-physiology.

#### DISCUSSION.

DR. MORSE. Gentlemen, you have listened to the careful and well-described technique of Dr. Bishop as contrary to the too usual imparity in the treatment of symptoms. I hope the ideas which the doctor has given us will bring out a little discussion as to the experience of the gentlemen who are using these methods.

DR. EATON. It is hardly fair to call upon me. In all the meetings in the past it has seemed to be my part to be called upon, but I think there are many others who want to speak to-night. I agree most heartily and fully with all that Dr. Bishop has told us, and I believe we are in just the right line to meet the diseases of which he has spoken to-night.

DR. GRANGER. I agree with Dr. Eaton and I have enjoyed the paper most thoroughly and got a good many ideas which I shall put into practice later. The great majority of the cases I meet are those of nervous exhaustion, and have treated more with the static wave current than any other one current. In a case of neuritis I should use the positive pole.



In cases of goiter I entirely agree with Dr. Bishop that we have effected a reduction not only in the size of the gland but a decided reduction, sometimes even from thirty to forty beats of the pulse, which remains permanent to quite an extent. In the use of the constant current I think some one like Dr. Davis can give us a better talk.

DR. DAVIS. I was in hopes that I might be left alone to-night. After having listened to such an exhaustive paper as Dr. Bishop has given us, and one so entirely scientific there seems but little that we less prominent men can say. He has covered the subject very thoroughly indeed and has shown us that he has a good grasp of the subject and gone into it in a most scientific way, and for that reason it seems to me that what little I might say would not add much to the interest of the discussion.

DR. PITCHER. I have used the constant current for a good many years and tried all the new methods that have come into use. It has been very interesting to follow out the doctor's methods in many respects, and especially with regard to his test on the sensory and motor nerves.

Last week, when in Atlantic City, I listened to a discussion on goiter. There was very little said about the therapeutical or surgical part of it. Drs. Preble and Rogers, as you know, are making an exhaustive study of goiter and cure a certain percentage of cases but they admit that it is in the experimental stage. The gentlemen who spoke upon the treatment of goiter mentioned the electrical modalities as being beneficial only from a suggestive point of view. They thought there was no benefit from the treatment itself except as it affected the patient's mind. The discussion brought out very little about it as to whether their statements were true or not. They stated that there was no drug treatment whatever. It seems to me, however, that there is a great field yet for electrical treatment in goiter, for we know that with the constant current, especially, the action of the heart is affected.

DR. GRAY. I am pleased to say that this subject is getting on to what certainly seems to be a scientific basis. I am not so sure but what I shall shift over and become an electrotherapist if there is much more of that powder burned. We are apt to get into ruts and run along and do things because somebody else does them, without delving deeply into the reasons therefor, and if we get certain results we do not even then analyze them as deeply as we ought. But certainly when a man gives the care and attention to a thing which Dr. Bishop does, his conclusions certainly are valuable, and when, in addition to that, he places it upon a scientific basis, it certainly puts it in a tangible form.

DR. THOMPSON. It is rarely that we listen to a paper which is so exhaustive and original. It is not at all uncommon in societies of this kind, and others, to hear a great deal of talking, but I think this paper will not only set us to talking but set us to thinking. If it is now in order, Mr.

President, I should like to suggest that a hearty vote of thanks be extended to Dr. Bishop for his very helpful paper.

DR. BUCK. I hardly feel that I have any right to speak here to-night because I am rather a newcomer in the field. I have been very much interested in the paper we have heard as I have been interested in the doctor's writings and a close student of his methods. Most of my work has been along the line of the static current. I have found that with my static machine I can do very nearly as much, and in many cases possibly more, than I can with the constant current. I feel that the static machine has great possibilities, and I think that its benefits are yet to be developed even more than we have seen them in the past.

DR. GOODELL. Before this meeting is closed I would like to have Dr. Bishop explain the static machine cage of which he spoke.

DR. REEVES. I don't think I can add very much to what has already been said. In talking about the treatment of goiter, etc., one man gets up and gives his experience in the line of experimentation with the constant current. They have all had cases which they have helped a great deal. The next man you see has a great deal to say about the faradic current. Another comes along and has a little story to tell about the static machine. If we could get down to the principles in treatment, always having some reason for what we do, we would get a great deal more out of the use of electricity than by using some method which has been suggested to us just because some one else has used it.

DR. ALLEN. I have been very much interested in this paper. Possibly I have not been quite as acute to take it in as some, but I hope this paper may be published so that we can take it home and read it carefully and make a thorough study of the matter. There is a great deal in it that is new to me and I believe new to us all. The main object is to make up our minds what the trouble is, as near as we are able to diagnose, and then have a common-sense idea of what we are going to do. When I began to practice, twenty years ago, the galvanic current was the current that I was first taught to use extensively, though we had, to be sure, the static machine and used to do good work with it.

I was much interested in Dr. Bishop's statement in regard to the treatment of strictures, as I have had some little experience along that line. I have found that in passing the olive tips we do not take into consideration the expansion we are apt to get. I have a device which I use which is a little circular clamp. I bring just the slightest circular pressure upon that and then as the olive tip passes through it does not stretch it out. I may perhaps produce a little more electrolysis on the stricture but I do not think it does any harm.

DR. MCFEE. I regret that I was a little late in getting into the meeting to-night and so did not hear the whole of the paper. There is one case

of mine which I would like to ask Dr. Bishop's opinion about. The patient came to my office recently with pain in the supraorbital region which he said had extended over a period of two years. Some others whom he had been to had made a diagnosis of neuritis of the supra-orbital nerve. I started in to treat him with the wave current in combination with the brush discharge. I found the nerve very sensitive to the current. I would like very much to hear what Dr. Bishop would advise in a case of this kind.

DR. BISHOP. Mr. President, ladies and gentlemen: You cannot imagine how deeply I thank you for the kind reception of my paper. You must readily understand that I do not, for a moment, consider it a perfect paper. It is simply a result of some of my observations made upon a physiological basis, and I lay it before the medical profession in order that we may place electrotherapeutics upon a scientific basis. I do not pretend to say that all the claims I have made are correct, but even if they are wrong, if I can, by this means, cause others to think, they may, perhaps, get into the right line of thought and produce results which we know electrotherapeutics can produce. We get a certain result. If we get it once we ought to get it all the time, and until we perfect our electrotherapeutics it will never be a science.

In such cases as Dr. McFee has spoken of I have always gotten the best results from the constant current from the negative pole instead of the positive. I apply the negative pole there and use a very mild current, working upon the basis, as we have learned, that the negative pole is alkaline and the active nerve is acid.

I thank you very much for your kindness and for the consideration you have given my paper.

In relation to the static machine cage. I give that treatment when I want to give a great deal of ozone, such as cases of bronchial trouble and diseases of the lungs. In cases of neurasthenia, I place the patient reclining under the canopy.

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"As a horse when he has run, a dog when he has tracked the game, a bee when it has made the honey, so a man when he has done a good act does not call out for others to come and see, but he goes on to another act, as a vine goes on to produce again the grapes in season."— *Marcus Aurelius Antoninus*.

"Do everything in conformity with the soundest reason. For such a purpose frees a man from trouble and warfare and all artificial and ostentatious display."— *Marcus Aurelius Antoninus*.

"USEFULNESS comes by labor, not by ease."— *George Herbert*.

# DEPARTMENT OF DIETETICS

## THE PRESERVATION OF MILK.

J. A. DENKINGER, M.D., BOSTON, MASS.

MILK has ever had the reputation of being one of the most valuable and nutritious of all food products.

Apart from its almost countless domestic uses, milk in some form is, and must ever be, the basis of all rational foods for artificially fed infants, and despite all old and new dietetic fads, milk remains the sheet anchor of the physician in cases of illness, whether acute or chronic.

Unfortunately, the very nature of milk, as well as the conditions surrounding its production, handling and storage at the farm, during transportation and in the home, make the preservation of milk in liquid form for more than a few days, impractical, if not impossible.

Such being the case, it is not at all surprising that innumerable attempts have been made, by chemists and others, to so conserve milk as to make it keep indefinitely, without damaging its nutritive properties. Processes of preserving milk more or less successfully, for a short time at least, date back more than one hundred years.

Paul Guerin \* credits the invention of the process of concentrating milk and preserving it with sugar to A. A. Parmentier and Guyton de Morveau. This was in 1807, just one hundred years ago.

Since that time a great number of patents have been issued for real or imaginary improvements in the process, with the result that claimants for the honor and fame of having invented condensed milk are rather numerous. Only a short time ago there was found in the old burying ground at Winchendon, Mass., a white marble slab bearing this inscription:

Stephen F. Fassett

grandson of

Levi Bixby

Died May 8, 1856

aged 54 years

I began the preserving

of cow's milk with white

sugar for the use of steamers

crossing the Atlantic Ocean.

\* Dictionnaire des dictionnaires, vol. 4, page 948.

I regret that I have not had the necessary leisure to investigate the claims of this "voice from the tomb."

The credit of being the first to make the process of condensing milk practical, which comprised inclosing the condensed milk in hermetically sealed tins, belongs unquestionably to Martin de Lignac, a Frenchman, who must ever be considered the father of the condensed milk industry.

De Lignac patented his process in 1847. In 1849, he was awarded a silver medal at the French Exposition, for the excellence of his product and the practicality of his process. By command of the Marine Minister, experiments were instituted at Toulon, with De Lignac's condensed milk, the reports upon which were on all points most favorable. It soon became evident that De Lignac's method of condensing milk was preferable to all others, for which reason the lords of the English admiralty were led to introduce the milk into the English navy. As early as 1849, De Lignac furnished 45,000 cans for this purpose.

We read that De Lignac exercised extraordinary care in securing fresh and high-grade milk for making his condensed milk. De Lignac's process consisted in evaporating the milk, after the addition of the necessary cane sugar to preserve it, to the consistency of a thick syrup, in double, very shallow, open pans. As the industry developed, it was again De Lignac who suggested the use of a mechanical agitator, and concentrating the milk in vacuo at a low temperature, which, with slight modifications, is the process now in use. The process of concentrating fluids in vacuo was already well known at this period and was used in a number of industrial arts, such as the manufacture of extracts and sugar. [De Grand (1837) and Sastier (1839) used the vacuum process in the conservation of meat.]

Coming now to this side of the water, we find, that in 1856, a patent was granted by the United States Government, for an "improvement in concentration of milk." The improvement *claimed*, consisted in applying the vacuum process to "produce concentrated sweet milk, the same having no sugar or other foreign matter mixed with it." Curiously enough, the "process" proved a failure, as milk put up in sealed tins by this process kept only a few weeks, and the manufacture of "tinned" unsweetened condensed milk, for which a patent was granted, had to be abandoned for many years.

The first to successfully produce unsweetened condensed milk in hermetically sealed tins was N geli, of Munich, who exhibited his unsweetened condensed milk at the Berlin Exposition in 1879; he was followed in 1880 by Scherff, who invented a new process.

The first firm in this country to produce unsweetened condensed milk in sealed tins, *that would keep*, was the Helvetia Milk Condensing Company, of Highland, Ill. This was in 1885. This company also

originated the name, "Evaporated Cream" for this product, which euphonious appellation, not being protected by copyrights, was promptly pirated by the numerous imitators of the original "Evaporated Cream."

As the name "Evaporated Cream" comes under the head of "mis-brands" under the provisions of the new pure food law, the name of all brands of "Evaporated Cream" has recently been changed to "Evaporated Milk."

Roughly speaking, condensed milk is simply milk from which the water has been evaporated in vacuo to about one third of the original bulk of the milk. One gallon of milk is evaporated down to two and a half pints. Each tin represents about one quart of milk. In the case of sweetened condensed milk, one and a quarter pounds of cane sugar is added to each gallon of milk. Standard condensed milk contains 28 per cent of milk solids, of which not less than one quarter is milk fat. In the case of unsweetened condensed milk, the high temperature used in sterilizing the milk is depended on to prevent bacterial growth. It is this that gives this class of condensed milk the peculiar taste of cooked milk.

With sweetened condensed milk, the use of "sterilizing temperature" is rendered unnecessary by the addition of the large quantity of cane sugar, which preserves the milk by preventing bacterial growth, as bacteria do not grow in a material which contains great quantities of sugar.

Condensed milk is, however, not in all cases absolutely sterile.

Exhaustive analyses made in the laboratory of the Inland Revenue Department of Canada also show great differences in the composition of condensed milk in tins made from the same batch or "run"; this applies especially to fat and sugar.

While condensed milk represents quite a step in the science and art of milk preservation, it did not satisfy the inventive genius of man for long. The objections to condensed milk are both numerous and serious, but need not be dwelt on in this connection.

Many have been the attempts to reduce milk to powder or tablet form, without sacrificing its solubility, digestibility, or its nutritive value.

According to X. Rocques,\* Appert, the father of the food-preserving industry, made tablets from milk as early as 1811, but the process was not commercially successful.

In 1850, Dalton, Blatchford, and Harris, working under the direction of E. N. Horsford, later professor of chemistry at Harvard University, commenced the manufacture of milk cakes made from the whole of the milk, in the state of New York, but the cakes did not keep well and were not perfectly soluble, and the process was soon abandoned.

One of the earliest attempts to produce milk in powder form was made by Grimwade in 1856, but the process did not prove a success.

\* Les Industries de la Conservation des Aliments, Paris, 1906.

Conserves containing milk in powder form have been on the market as early as 1865, but their milk contents (compared with more recent products) were rather low and, like the semi-liquid sweetened condensed milk, they were loaded with a large quantity of cane sugar, to insure its preservation; they contained, moreover, a high percentage of *baked* wheat flour (the powdered crust made of thin sheets of wheaten bread, as one manufacturer put it) the starch of which was only partially converted, still leaving from 30 to 40 per cent of unconverted starch. This type of milk food required cooking for its preparation, which meant numerous additional disadvantages.

What is to-day regarded as the perfection of a milk-food in powder form — Horlick's Malted Milk — was originated some twenty-six years ago, by Mr. Wm. Horlick, of Racine, Wis., by what is known as Horlick's process.

"By combining pure, rich milk with the extracts of malted barley and wheat, he found it possible not only to preserve the milk indefinitely, but to obtain in powder form a product far more nutritious and digestible than ordinary or condensed milk, and perfectly soluble in both hot and cold water. All the useless water in condensed milk has been removed and instead of the cane sugar, so often objectionable to delicate stomachs, the nutritive extracts of the malted grains are used to enrich the milk." — *Scientific American Export Edition*, July, 1905.

As to the ingredients used in the manufacture of Horlick's Malted Milk and the general method of manufacture:

Aside from the milk, which is, of course, the basis of malted milk, the other ingredients entering into the composition of Horlick's Malted Milk are crushed barley-malt, made from choice barley, by an improved process in the company's own malt-houses, and selected wheat flour.

These cereal products are macerated in pure, fresh water, obtained from a spring located on the laboratory grounds. The temperature is then raised and the "mash" is thoroughly agitated. During this process, all the starch of the cereals is converted into soluble carbohydrates — maltose and dextrine — by the malt ferment diastase, the amount of diastase developed in the barley-malt being sufficiently ample to convert the starch of the wheat as well as that of the barley.

As soon as the resulting mash becomes sufficiently thin, it is pressed and filtered, which process removes all the husks and other insoluble materials of the cereals. It is then mixed with an equal quantity of pure milk, cream and all, previously pasteurized, and evaporated to dryness, with constant stirring, in a vacuum pan. During this process the milk is fully exposed to the action of the malt enzymes.

Much interest and — let us admit it — some speculation has attached to the action of the malt ferments on the milk during the process of manufacture.

According to physiological chemists, who have given special attention to ferments, barley, by the process of malting, develops besides amylase (or diastase, the name by which it is better known) other active substances, amongst them one having a proteolytic action, peptase, which has the property of transforming albuminoid substances, especially insoluble albuminoids, into peptones and amides. Another ferment found is cytase, which acts on cellulose. Peptase, first described by Gorup-Besanez, the eminent physiological chemist, has never been isolated from the diastase of malt, and it is not known just how it acts. Later-day physiological chemists have thrown but little additional light on the nature and action of peptase. According to Professor Mathews, it can dissolve albumin and gives rise to diffusible nitrogenous substances, allied to peptones. Professor Bartley states that diastasic action is not limited to starch conversion, but includes formation of peptones, especially out of the albuminoids, derived from cereals and milk casein, as well as other animal food. Other authorities citing peptase, are Effront, Thorpe, Wagner, Moritz and Morris, Prior, and Griessmayer.

There is, then, no question as to the existence of the ferment peptase or vegetable pepsin, or plant pepsin, as it is sometimes called, but it is quite another matter to determine *just how much influence* the ferment peptase exerts on the proteids of the milk and cereals during the process of manufacture of malted milk.

To my mind, this process involves both mechanical and chemical action. The vacuum pan used in the manufacture being supplied with "stirrers," the cereal extracts and the milk are kept in continuous agitation; this process of churning resulting in a most thorough admixture of the milk and cereal extracts, favored by the temperature maintained during the process, unquestionably contributes materially to render the proteids of the milk in malted milk more digestible; but whatever the action, chemical or mechanical, or (as I believe to be the case) both, the fact remains, that the proteids in malted milk, whether tested in the laboratory or clinically, form fine, soft, loose, and porous flocculi in the presence of the gastric fluids, instead of the large, tough, and leathery curds typical of unmodified milk.

Horlick's Malted Milk, as it reaches the consumer, contains all the nutritive properties of the milk and cereals entering into its composition, unimpaired in any way, extraordinary care having been taken during every stage of manufacture, especially upon addition of the milk, not to expose the food materials to any temperature which would in any way affect the digestibility or impair the nutritive value of the food.

A word or two as to the character of the milk entering into the composition of Horlick's Malted Milk: All the milk is obtained from dairies under the immediate inspection of the veterinary surgeons and chemists



of the company, and extraordinary precautions are taken to obtain pure milk, free from all disease germs, stable dirt, and other sources of contamination. The iron-clad *milk regulations* of the company, which are strictly enforced, and which cover every phase of milk production, including the selection and care of the cows, as well as the proper manipulation of the milk at every stage of its production, might well be copied by the foremost sanitary dairies of this or any other country. The regulations provide for the proper housing, feeding, and watering of the cows, their cleanliness, as well as for the most scrupulous cleanliness of milkers and milking utensils, and cover the process of milking and the cooling, aërating, and transportation of the milk to the model milk-house of the company located on the laboratory grounds.

#### SOME OF THE USES OF MALTED MILK (HORLICK'S).

Malted milk has probably the widest scope of usefulness of any food-product manufactured, and has been well named "the food of the age." Hot or cold malted milk, plain or flavored, is certainly one of the most palatable, healthful, and substantial food-drinks for table use, and in every way superior to such injurious beverages as coffee and tea.

As an artificial food for infants (sick or well), malted milk prepared with water only or modified to meet the individual requirements of the infant, has a most enviable record.

The same applies to malted milk as a food for invalids, convalescents, and the aged, and in the dietetic treatment of such diseases as typhoid fever, gastritis, alcoholism, nephritis, heart disease, tuberculosis, and the various functional neuroses. A glass of malted milk taken hot immediately before retiring is the dietetic remedy *par excellence* in cases of insomnia.

Horlick's Malted Milk is also manufactured in tablet form, natural and chocolate flavor. The tablets are intended to be eaten dry. They are exceedingly convenient, possess an agreeable flavor, are easily assimilated, and contain the maximum amount of nutriment in the smallest possible compass. They make an ideal lunch for business and professional men and women, for ladies on shopping tours, travelers, golfers, wheelmen, athletes, and sportsmen generally. They also form a healthful confection for children in place of candy.

As a dietetic preparation they are specially indicated in dilatation of the stomach and certain forms of heart disease where a fluid-diet is contra-indicated and where food in dry, concentrated form is advisable. They are also useful when the stomach is in such an irritable state as to reject all food in fluid form. If, in this condition, one or more tablets are allowed to dissolve on the tongue without chewing, simply mixing with a little saliva, only a small quantity of fluid food enters the stomach. The

amount is sufficient, however, to maintain nutrition until the excessive irritability has subsided, when malted milk in solution can be administered in moderate amounts.

In the case of gastric irritability of infants, when the smallest amount of fluid administered is rejected, the writer found that by sprinkling a little malted milk powder on the baby's tongue, the malted milk is licked up instinctively by the infant, rapidly dissolved, and carried to the stomach without causing regurgitation and vomiting.

Has the art of milk preservation reached its limit? I believe not.

For some time, inventors have been hard at work trying to reduce whole cows' milk, cream and all, to powder form, without cereal or any other addition. As such a powder would contain fully 30 per cent of fat, we can form some conception of the difficulty of the problem.

A number of inventors have been able, by various processes, to produce a milk powder, or milk-flour as it has been called, from skim milk, or milk containing only a small quantity of fat. These preparations have found a ready market with confectioners, bakers, and others, who use the skim milk powder in place of fresh, fluid milk; this type of milk foods, is, of course, unfit for infants and invalids.

Thus far, all attempts to obtain a milk powder from whole milk and whole milk only, have been a failure; all experiments, in that direction, have invariably resulted in a product rancid in taste and odor, and more or less insoluble, and with its digestibility and nutritive properties impaired.

There is both fame and fortune in waiting for the chemist who succeeds in producing a marketable milk powder, made from whole milk only, soluble in water, which will keep indefinitely in any climate, and containing all the ingredients of the original milk without damage to their digestive and nutritive qualities.

Such a product will truly revolutionize the dairy trade and solve the milk problem for millions of people.

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“ WEALTH without contentment climbs a hill.” — *George Herbert*.

“ RECEIVE wealth or prosperity without arrogance, and be ready to let it go.” — *Marcus Aurelius Antoninus*.

“ REMEMBER, the only way of setting the *will* free is to deliver it from wilfulness.” — *Augustus Hare*.

“ ENVY not greatness; for thou makest thereby thyself the worse, and so the distance greater. Be not thine own worm; yet such jealousy as hurts not others, but may make thee better, is a good spur.” — *George Herbert*.

# EDITORIALS

## Journal of Therapeutics and Dietetics

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The editor is not responsible for the statements or opinions of contributors.

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PITTS EDWIN HOWES, M.D., *EDITOR.*

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### CONDITIONS VS. DISEASES.

THAT the *conditions* of our patients and not their *diseases* are the most important things to be determined before treatment begins is being accepted more and more by the medical profession at large.

This has been the *ultimatum* of the Eclectic School in medicine for many years, and its gradual acceptance by other branches of the fraternity must be to them very gratifying.

At a recent meeting of the American Electro-Therapeutic Association, held in Boston, this thought was very strongly emphasized by many of their avowed leaders.

They declared emphatically that it was the *first* thing of importance to determine exactly the condition of the patient before attempting to bring about a restoration to health. The giving of a name to a variety of symptoms and treating that name was to invite failure rather than success. The exact conditions should be sought after and the various electrical modalities, according to their known influence, should be adapted to their relief. In proportion as this was accurately executed would success attend their efforts.

This same factor is also advocated by the most prominent dieteticians of the day. They also claim that the various varieties of food products are to be adapted to the conditions of the patient and not to the totality of

symptoms known as disease. That such thoughts and expressions as these are becoming more and more prevalent among the most successful physicians of our day cannot be denied. It is indeed a hopeful sign, and while many are drug nihilists, yet the day will soon come when all will study drug action along these lines, and drug therapy will occupy its rightful position as a factor in the restoration of normal conditions.

#### ANNOUNCEMENT.

THOSE members of the medical profession who believe that the tendency of the times is toward surgical operations that are unnecessary, and many times absolutely useless, will welcome with great pleasure the announcement that a new book, "*Essentials of Medical Gynecology*," by A. F. Stephens, M.D., is soon to be issued by The Scudder Brothers Company, of Cincinnati, Ohio. Dr. Stephens is a forceful writer and, while he accepts the *legitimate* use of surgery in this prolific field, he also decidedly objects to its taking the place of other agents in the curation of this class of ailments. The book will be reviewed later.

#### BOOK REVIEWS.

ALL books reviewed in this department will be sent, postpaid, upon the receipt of the quoted price. Send money order or bank check, making payable to Pitts Edwin Howes, treasurer.

*Diseases of the Digestive Organs, for Students and Practitioners of Medicine.* By Owen A. Palmer, Ph.D., M.D. Author of *Physical Perfection; Essays on Country Surgery*. Late professor of hygiene in the Western Reserve College; lecturer on physiology and hygiene in Baldwin University; ten years sanitarium superintendent; member of the American Institute of Homœopathy and the Ohio State Eclectic Medical Society. Octavo, pp. 524. Illustrated. Price, \$3.00. Published by the author. 1948 East 101st Street, Cleveland, Ohio.

We have turned the leaves of this work with much pleasure as well as profit. The author is to be commended for the amount of practical and useful information which he has gathered within its pages. A quotation from his preface will best show its scope. "The stomach is the center of nutritive processes of all animal bodies, and any derangements of its functions are at once felt in all the structures associated with it. It has been my object throughout this volume to present the plain and practical facts in so simple a manner that they can be easily adopted by the busy practitioner."

*Eating to Live*, with some advice to the Gouty, the Rheumatic, and the Diabetic. A book for everybody. By John Janvier Black, A.M., M.D., member of the College of Physicians of Philadelphia; member of the Delaware State Medical Society; author of *Forty Years in the Medical Profession, Cultivation of the Peach, Pear, Quince, and Nut-bearing Trees*, etc. Second edition. 12mo, pp. 412. Cloth, price \$1.50 net. J. B. Lippincott Company, Philadelphia, U. S. A.

This book should be in the hands of the profession and the laity. All can derive much good from its perusal. Without doubt its sales will be large.

*Pharmacology and Therapeutics*. By Reynold Webb Wilcox, M.A., M.D., LL.D., professor of Medicine at the New York Post-Graduate Medical School and Hospital; consulting physician to the Nassau Hospital; visiting physician to St. Mark's Hospital; ex-president of the American Therapeutic Society; fellow of the American Academy of Medicine; member of the American Medical Association; vice-chairman of the Revision Committee of the United States Pharmacopeia, etc. Seventh edition revised, with Index of Symptoms and Diseases. 12mo, pp. 885. Cloth, price \$3.00 net. T. Blakiston's Son & Co., Philadelphia.

The fact that a new edition of the above work has been called for so soon attests its popularity among the medical profession. There is much therapeutic knowledge to be gleaned from its pages, notwithstanding that many remedies are given scant treatment.

*Materia Medica and Pharmacy*. By Reynold Webb Wilcox, M.A., M.D., LL.D., professor of Medicine at the New York Post-Graduate Medical School and Hospital; consulting physician to the Nassau Hospital; visiting physician to St. Mark's Hospital; ex-president of the American Therapeutic Society; fellow of the American Academy of Medicine; member of the American Medical Association; vice-chairman of the Revision Committee of the United States Pharmacopeia, etc. Seventh edition revised. 12mo, pp. 490. Cloth, price \$2.50 net. P. Blakiston's Son & Co., Philadelphia.

This is the companion volume of the above and both should be studied together. Used in this way they make a very comprehensive work along the lines followed by its distinguished author. No one can study these books without being the gainer thereby.

*An Eclectic Compendium of the Practice of Medicine*. By Lyman Watkins, M.D., professor of Physiology in the Eclectic Medical Institute, Cincinnati, Ohio. 12mo, pp. 460. Cloth, price \$2.50 net. The Scudder Brothers Co., Cincinnati, Ohio.

This little work is to be commended especially for those who wish to get an outline, as it were, of the Eclectic Practice of Medicine. It can be read with much profit, and will prove a stimulant for more knowledge along the same lines.

*The Home Life in Order, or Personal and Domestic Hygiene.* By Alfred T. Schofield, M.D., late lecturer and examiner, National Health Society, and member, Sanitary Institute; vice-president and examiner, British College Physical Education; hon. physician, Friedenhem Hospital, etc. 12mo, pp. 345. Illustrated. Cloth, \$1.50 net. Funk & Wagnalls Company, New York.

This work is admirably adapted to the niche it is designed to fill. Within its pages is crowded much which all interested in these subjects should understand. In his preface the author well says, "Nevertheless the need of sound knowledge to-day is still overwhelming, and I am certain that the lives of thousands of infants and children, besides the welfare of many a home, would be insured were the simple teaching on hygiene here given, known and practiced."

*Food and the Principles of Dietetics.* By Robert Hutchison, M.D., Edin., F.R.C.P., assistant physician to the London Hospital and to the Hospital for Sick Children, Great Ormond Street; author of "*Lectures on Diseases of Children*," "*Patent Foods, and Patent Medicine*," joint author of "*Clinical Methods*." With plates and diagrams. Second revised edition. Octavo, pp. 582. Cloth, \$3.00 net. William Wood & Co., New York.

We are glad to note the revision of this work. Without doubt it is the peer of all books along this direction of thought. Its readers cannot fail to become well-grounded in the principles of dietetics. The usefulness of these principles is being recognized by the profession at large to a greater extent than ever before. Such recognition must result in good to humanity.

*Essentials of Milk Hygiene.* A Practical Treatise on Dairy and Milk Inspection and on the Hygienic Production and Handling of Milk, for Students of Dairying and Sanitarians. By C. O. Jensen, professor in the Royal Veterinary and Agricultural College of Copenhagen, Denmark. Translated and amplified by Leonard Pearson, dean of the Veterinary Faculty of the University of Pennsylvania, State Veterinarian of Pennsylvania, member of the Advisory Board of the State Department of Health, and member of the Board of Health of Philadelphia. Illustrated. Octavo, pp. 275. Cloth, price \$1.50 net. J. B. Lippincott Company, Philadelphia.

To all that have to do with milk and the recognition of its purity, as well as its various impurities, this book will prove a valuable guide. It should be widely read.

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No. 2.

## CACTUS GRANDIFLORUS.

MUCH is being written in medical journals at the present time concerning the various preparations of this plant. Some is of a laudatory nature, while much is derogative.

Without doubt those who cannot procure good results from its use are the ones who have been working with inferior preparations and thus cast an unjust reflection upon what is a most useful adjunct to our heart remedies. Many of the therapeutic nihilists of our day have been produced because of the *imperfectly prepared* drugs with which they endeavored to get results, and failed because the drug could not, as it was made, produce what was expected.

Cactus is another of those plants which should be used in its *green* state in order to procure reliable remedies. Probably the wrong method of manufacture is responsible for many of its failures.

Among its specific indications may be mentioned, impaired heart action, whether feeble, violent or irregular; cardiac disorder, with nervousness; precordial oppression; anxiety; apprehension of danger or death; hysteria; tobacco heart; nervous disorders with heart complications.

The effects of cactus are not merely evanescent, but lasting. The nutrition of the heart is increased, its contraction strengthened, and its irregular rhythm controlled.

Cactus spends its force upon the sympathetic nervous system and is particularly active upon the cardiac plexus.

Prof. E. M. Hale, M.D., says: "It acts upon the circular cardiac fibers, whereas digitalis acts upon all the muscular fibers of the heart. Like the latter, as a secondary effect of overstimulation, it may induce heart failure."

One of the most advantageous fields for the successful use of cactus is in those nervous disturbances of women which are connected with the menstrual flow and are complicated with heart disorders dependent upon the nervous disarrangement.

In such cases cactus will prove a valuable adjunct to many of the remedies prescribed at these times, such as helonias, hyoscyamus, macrotys, pulsatilla, xanthoxylum. Indeed, many times the addition of the cactus to these drugs marks the result between success and failure.

Dose: Fluid extract, gtts. ij to gtts. v; specific medicine, gtts. ss to gtts. x. It should be preferably administered in water largely diluted.

# DEPARTMENT OF THERAPEUTICS

## VESICARIA COMMUNIS.\*

BY C. EDWIN MILES, M.D., BOSTON, MASS.

VESICARIA COMMUNIS, *Gemeines Blasenkraut*, common bladder plant.

Complying with the request to present a paper to this meeting on vesicaria communis, I trust the suggestions I may be able to offer relating to it will be of interest to the profession and helpful in alleviating diseases of the urinary organs.

My attention was first called to this drug in a paper by George R. Shafer, M.D., Morton, Ill., published in the *Transactions of the National Eclectic Medical Association*, vol. xxv, 1897-98.

He says: "This is an old-fashioned remedy much used by the laity in some parts of Germany for all forms of urinary diseases."

In his use of the remedy he had found its most important indications to be in the smarting, burning sensations in the urethral tract, in the bladder, and with frequent desire to void the urine accompanied with stranguary.

Cases were cited, with his method of administering the remedy and the results obtained which indicated the therapeutic value of the drug.

In 1901 two cases of chronic cystitis, which had been treated for three months by skilled physicians without benefit, chanced to come under my care. The disease in both cases progressed in severity despite my efforts to give relief.

I then sought to obtain the tincture of vesicaria communis without avail, it being unknown to the prominent druggists in Boston. On corresponding with Dr. Shafer, he informed me he had originally procured his tincture from Germany, but at that time, 1901, he was obtaining it from Luytie's homeopathic pharmacy, they having procured the tincture from the German plant through their German pharmacy, and it was giving satisfactory results.

I procured the tincture as suggested by Dr. Shafer and promptly commenced treatment with the remedy to the above-mentioned patients. In two weeks both patients were markedly improved. And after six weeks' treatment the younger, a male, age forty-five years, had fully recovered, and the elder, also a male, age fifty-five years, was well.

It is intimated the plant has been found in this country producing a

\* Read at meeting of Massachusetts Eclectic Medical Society, June, 1907.



tincture as efficient as that imported from Germany. If this be true, those furnishing it to the drug trade are very reticent in communicating its habitat.

After much painstaking, B. O. & G. C. Wilson and Otis Clapp, both in Boston, are furnishing a reliable tincture for my dispensing.

I will now endeavor by a résumé of the following cases, clinically observed and treated with the tincture of *vesicaria communis*, to illustrate its therapeutic action in diseases of the urinary organs:

CASE I. Active, intelligent boy, age five years, in normal condition except since his third year had continued to suffer with nocturnal enuresis. Many drugs and judicious care had failed to give any relief for the difficulty. Prescribed x gtts. at 4 P.M. and xv gtts. on retiring. Relieved in one week. Cured in four weeks.

CASE II. Bookkeeper, male, age twenty-two years. Had to stand at desk during the day's work. Healthful except compelled to void urine hourly when at work. Had so continued for more than two years. I, with others, had failed to relieve the difficulty. Prescribed tincture *vesicaria*, xv gtts. every two hours. Benefited in three days. Cured in four weeks. An occasional remission promptly relieved as before.

CASE III. Madame C., age fifty-five years, widow, scalding urine, tenesmus, often mucous discharge. Commenced at beginning of menopause. Had been much treated by many physicians with but little relief. Gave by the weekly vaginal douche, water, 2 quarts; Lloyd's fluid hydrastis, 3j; also tincture *vesicaria*, xx gtts. every two hours for two weeks. Improved. Douches continued; tincture *vesicaria*, gtts. xx every three hours. Two months, cured.

CASE IV. G. F., male, age fifty years. Conductor on steam railroad. Chronic cystitis; continued two years. Always scalding urine, tenesmus, mucous discharge. Douched bladder with water, 3 quarts; fluid extract *hydrastis canadensis*, 3j; tincture *vesicaria*, gtts. xx; every two hours for two weeks. Repeated douche; drank freely of Poland Spring water; continued *vesicaria* for three months. Recovered.

CASE V. F. B., male, age twenty-eight years. Took cold wading in water when fishing during summer vacation. After suffering for three days returned to the city with all the symptoms of acute cystitis in an aggravated degree. Ordered prolonged hot bath, tincture *vesicaria*, gtts. xx, every hour; repeated bath in twelve hours; continued *vesicaria*; in twelve hours repeated the hot bath; continued *vesicaria*. Fully recovered in forty-eight hours.

CASE VI. S. M., robust male, age twenty-two years. Untreated gonorrheal cystitis, fifteen days' duration, scalding urine, tenesmus, free discharge. Prescribed tincture *vesicaria*, gtts. xv, every hour; injection, Lloyd's fluid hydrastis, gtts. xxx, aqua 3iv, every six hours. Continued

treatment three days. Relieved. Continued tincture vesicaria, gtts. xx, every two hours for eight days. Cured.

CASE VII. Female, age seventy-five years. Chronic cystitis; two years' duration. Steadily been growing more severe for ten years. Been treated with domestic remedies. Scalding urine; severe tenesmus; urine dribbles when in sitting or erect posture; muco-purulent discharge. Douched bladder every fourth day with saturated solution of boracic acid, 3 quarts; fluid extract hydrastis, 3j; tincture vesicaria, gtts. xx, every hour for two weeks, then every two hours for three weeks. Much improved. Continued treatment. After three months' treatment patient recovered. During the remaining three years of life only slight recurrence of the disease, promptly relieved by treatment with vesicaria.

Acute nephritis with frequent desire to void urine, with scalding, is often relieved by tincture vesicaria. It is compatible with remedies usually prescribed in that disease. In cases of frequent, also difficult, voiding of urine, and in non-paralytics, dribbling urine in elderly persons, are all benefited with this remedy.

In the administration of tincture of vesicaria communis, I have never observed it to produce an abnormal action. Age, systemic and the various pathologic conditions will indicate the dosage. In cystitis, the chronic variety, especially if there is a muco-purulent discharge, there will be a necessity to prescribe full doses of the drug. My usual method is to give from 5 to 8 gtts. to the dram of aqua, increasing the quantity of the latter with the increase of the dose of the drug to be taken. The cases reported are those in which cures have been effected. Failure to cure, or to be relieved, however, has occurred, but with less frequency than with the use of any other drug which I have prescribed under like conditions.

My conclusion, based on my observation in the treatment of the diseases of the urinary organs, is that the tincture of vesicaria communis has a specific action on the pathologic conditions of their mucous tissues.

It may be asked, if the drug has a specific action on the pathologic condition of the mucous tissue, why a failure to cure these cases should occur.

The answer is evident. The condition may have been beyond cure. There may have been error in diagnosticating complications or in the size of the dose, or in proper care of the patient. So in a variety of ways may the favorable action of the remedy be prevented. But the therapeutic nihilist imputes the failure to the drug.

*"Like produces like" is a truism.* The drug that effects a cure, *given like conditions in toto*, will ALWAYS produce like results.

Objection has been made to the use of vesicaria because the treatment is empirical. But every treatment, the testing of every remedy is, in a

way, empirical. The laity have used many remedies and discovered their therapeutic value before the medical profession had even known of the drug. We may have a theoretic scientific basis for the action of drugs empirically, then the more satisfactory theoretic certainty. One has said, "Vain is learning without wit," and vain is science without certainty.

When I commenced to practise medicine here, forty-seven years ago this month, there were a number of drugs now highly esteemed by the most eminent practitioners of Boston, that I could not purchase at the best drug stores in the city. Gelsemium, hydrastis canadensis, and even veratrum viride were then prescribed empirically.

Quite as scientific are certain of the drugs — the use of which is considered empirical — as are many of the triturate tablets that the recent graduates of our scientific medical schools are doling out to their patients under the instruction of the traveling tablet-selling vender.

I am confident that an empirical study of a drug gives a more thorough knowledge than can be acquired in the tablet triturate method of treating the sick.

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## PRURITUS.

BY W. C. ABBOTT, M.D., CHICAGO, ILL.

NASAL pruritus with asthma is relieved by quinine arsenate, gr. 1-67, every hour, or gr. 1-6 four times a day.

In any form of pruritus, arsenic usually gives relief, the choice depending on the other circumstances presented by the case.

Great relief may be obtained from ergotin, gr. 1-6, every hour until relief ensues or the full effect of the drug is manifested.

In obstinate cases, and those accompanied by free sweating, give atropine, gr. 1-500, every half hour till the mouth begins to dry.

For senile pruritus apply lotions of carbolic acid and give creosote internally in moderate doses.

In many forms, especially intense itching without visible lesion, gelseminine relieves, gr. 1-250 every hour until relief or the lids droop.

Gouty, plethoric, sedentary, neurasthenic, middle-life cases require colchicine, one to five granules, gr. 1-134, each, at bedtime.

As practically all cases are attended with constipation, give leptandrin, euonymin, iridin, or juglandin, 1 gr. of either, with bilein at bedtime.

In obstinate cases localized in the distribution of one or more nerves, give zinc phosphide, gr. 1-6, four times a day for one week, with neurolecithin the balance of each month.

Strychnine and brucine sometimes greatly benefit these cases, as do quinine and iron, when given to patients who need such remedies.

When pruritus attends acne or conditions of relaxation in general, give berberin, gr. 1-6, every hour while awake.

For pruritus attending diabetes use salicylic lotions and give salicylic acid in increasing doses until relief is obtained.

Prurigo is quickly relieved by pilocarpine enough to cause slight but perceptible sweating.

A pilocarpine sweat relieves all itching from jaundice, except that due to cancer of the liver.

There is scarcely any form of itching that is not relieved by pilocarpine, gr. 1-67, in hot water every ten minutes until sweating begins.

Prurigo is quickly relieved by solanine, gr. 1-12, every hour.

Anal itching is sometimes caused by coffee; nearly always by the irritating discharge from retained fecal collections.

Anal and pudendal pruritus sometimes caused by parasites and cured by their destruction.

Anal and pudendal pruritus is relieved by applications of bay rum, which heals lesions of the epithelium.

Itching of the skin is generally caused by elimination through it of matters which should have been excreted through other channels.

Begin in all cases by ascertaining why there should be pruritus. Have the urine examined and clear the bowels absolutely.

It is said that the use of aloes or of cascara tends to cause itching at the anus.

Some skins are so delicate that any ordinary soap will break the epidermis. Use soap made of absolutely pure materials.

Sometimes it is better to use no soap at all, but bathe twice a day in cold water, with brisk rubbing with a coarse towel.

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### THUJA OCCIDENTALIS.

BY CHARLES E. BUCK, M.D., BOSTON, MASS.

In these busy days, when every general practitioner feels the need of therapeutic agents from which he may expect definite results, when, if he holds his patients, he must satisfy them that they are receiving at least a return for their money, the mention of a remedy, be it old or new, that has proven successful in the hands of those who have had occasion to use it, in a large per cent of cases, should be of interest to us all.

There seems to be a diversity of opinion among the profession, as to which is the more desirable practice to cultivate, the office or bedside. Then again there is a doubt in the minds of many regarding the problem of using and dispensing one's own remedies, in the office or in general practice. To those who favor office procedure, and lean towards minor

operative measures, there is probably no remedy that has a wider range of usefulness than THUJA, or, as it is more often called, ARBOR VITÆ. There certainly is none that can produce such *satisfactory results*, attended with *so little danger* to the patient, as this one.

This agent is no new arrival, and the fact that it has contributed to the alleviation of over two centuries of suffering humanity is not at all to its discredit. Introduced into England in 1600, and into America a hundred years later, it has merited the esteem of all "pathies." Although it is now considered an eclectic remedy, it was not adopted by that branch of the profession until both homeopathic and allopathic practitioners had tested its virtues, and included it in their list of approved remedies.

This evergreen coniferous American tree, from 20 to 50 feet high, grows on rocky banks of rivers and in low swamps, from Pennsylvania northward, and is used in many places as a hedge plant.

Like most remedies of this kind that have come into use through their *own intrinsic value*, its use was at first empirical. It remained so, practically, until 1862, when, through an editorial by Dr. Scudder, Dr. Dickey took it up and made some investigations along scientific lines. It was not until twenty years later, however, that this valuable remedy received the recognition that was its due. It was then that Professor Howe became interested in it, and through his thorough investigations and warm commendations, the drug was firmly established in the class to which it belongs.

Through this investigator the active principles were definitely established, and placed in the hands of the general practitioner in the form of a specific tincture, in which form it is best exhibited to-day. There is an aqueous form manufactured that is for use in cases that do not tolerate alcohol, but this form does not seem to fully represent the true activity of the drug and is not in as much demand as the former.

Regarding the properties of this drug no words can be found more expressive than those of Professor Felter. He says that "Thuja has become one of the most important remedies employed in practice, both for its local and internal effects. Specifically it acts upon the vascular, cutaneous, and mucous tissues, stimulating them to normal activity, and in cases of flabby vessels, exciting them to contraction, and in cases of cutaneous over-activity, restraining hypertrophies and excrescences. Furthermore it is a decided antiseptic. It will deaden and repress fungous granulations, and may be applied to 'proud flesh' and ingrown nails with considerable success. It has a marked influence upon such chronic granulations as those of trachoma and epithelioma and is a very useful remedy in bed sores, sloughing wounds, fistulous openings, and to overcome the stench of senile and other forms of gangrene. Few mild agents have a greater reputation for the destruction of various kinds of papillomata

and for condylomata about the nates. It does not cure all cases, but is best adapted where there is softness and foul exudations. It cures many, though not all, cases of genital and venereal warts. It may be applied full strength to the surface or hypodermatically. It is a valuable remedy in fissure of the anus. It is valuable in checking hemorrhage from malignant growths, hemorrhoids, and bleeding moles, and has been of inestimable value in cases of 'bleeders.' In this case it has been applied after the extraction of teeth. It is of great service in nasal hemorrhage and for incised wounds. By the use of a compress, the full strength thuja has been the means of saving the lives of many children suffering from umbilical hemorrhage, occurring ten to fifteen days after birth. Professor Howe, and many others, testify to its efficiency in the treatment of bulging nevi, or 'mother's mark.' Ballington reports the cure of a child in three weeks' treatment from birth, with compresses of specific thuja."

It is in cases of hydrocele and hernia that this agent seems to fill a long-felt want. No single remedy seems to have given the universal success with so little discomfort in the cure of these very distressing conditions.

The use of the drug in these conditions is not absolutely painless, but the discomfort to the patient is so slight, as compared with that attending the use of the mixtures generally advised, that it is practically so. Then it is absolutely non-toxic, and the method of its use is very simple.

The technic used most successfully by the writer in treating hydrocele is as follows: Dilute one part of specific thuja (Lloyd's) with five parts of water in a test-tube, and with an alcohol lamp bring the mixture to a boil. Now take a "pen filler" (a large dropper holding about 2 drams), and, after boiling it, fill it with the solution and place in readiness for instillation.

Now tap the distended sac of the tunica vaginalis and, after all the liquid has escaped that it is possible to obtain, instill 2 drams of thuja solution through the canula, and then carefully knead the tissues so as to bring the solution in contact with every part of the sac. Some pain may or may not ensue, and of course there will be some swelling, after the subsidence of which, in about a week's time, if the work has been carefully done, there will be a very perceptible evidence of the formation of tissue, showing the influence of the thuja. It may be necessary to tap the sac again as a small amount of serous fluid will be in evidence in the sac even after the tissue formation has begun, and, as this will not all be changed into tissue, it is a good idea to remove it, but it is not necessary to repeat the instillation, only in a small per cent of the cases. The patient is not inconvenienced in his occupation at all, and it generally takes about a week for the swelling to subside, and after that it is but a question of time when the adhesions will contract down so as to very materially reduce the former size of the hydrocele. It will not return to normal size, but will be very much smaller than it was before treatment.

In hernia the solution may be the same, or full strength may be used, and the method will of course differ according to whether we are dealing with a direct or indirect case. The fluid should be delivered so as to cause a formation of tissue just across the hernia, and prevent it from advancing farther. These cases require a longer time, and more careful treatment than the hydrocele. In the case of hernia, after each instillation, which should be given about once a week, the truss should be well adjusted and this should be worn for six weeks and possibly more. The most satisfactory results are obtained when it is possible to have the patient off his feet for a week or ten days after the first treatment. After this he may follow his usual occupation, unless it is of such a nature that it will aggravate his trouble, in which case give him the alternative of either resting or changing his occupation.

Many other cases might be mentioned in which this valuable agent has proven its versatile utility, both in external and internal administration. The scope of this article will hardly admit of it, however, and with a few suggestions for the relief of nasal conditions and incontinence of urine in cases of senile prostate, the writer will leave the subject for the consideration of such of the readers as care to prove the efficiency of this valuable remedy by trial.

For nasal polypus put a few drops of specific tincture of thuja on a piece of surgeon's lint and lay this on a sixteen candle-power electric light. Adjust the light so that the vapor from the solution can be well inhaled, together with the heat and light, and the results will please any one who cares to try it.

In incontinence dilute 3 drams of specific tincture with 4 ounces of water and administer a teaspoonful every three or four hours and the results will be most satisfactory.

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### Therapeutic Nuggets.

**CHAMOMILLA.** Useful in spasmodic conditions attending teething in infants. Child is irritable, fretty, peevish. The remedy must be given in small doses. Chamomilla may be combined with aconite in these cases. Dose: one-half teaspoonful of the 3x dilution in one-half glass of water, a teaspoonful of the mixture to be given hourly. Chamomilla is also useful in infantile colic, or diarrhea, where there is great irritability and restlessness; diarrhea with green, watery stools, with colic, thirst, bitter taste, or bitter eructations. Is also useful in hysterical conditions.

**DIGITALIS.** Relaxation, weakness, dilatation of the heart muscle. Should never be given until compensation has failed. If given during the stage of compensation will hasten the death of the patient. Digitalis is a

powerful remedy and should never be given by a physician who is not competent to make a thorough physical examination of the patient. Digitalis is a slow acting drug, requiring two or three days to exert its full physiological or mechanical action and should, therefore, not be depended upon in an emergency. The tincture of the English leaves should be given to contract the heart muscle, and the infusion to increase the flow of urine. The keynote for the administration of digitalis is: relaxation, and dilatation, weakness, cyanosis, with a slow pulse increased on exertion. This remedy is a two-edged sword and must be carefully watched at all times.

**EMULSION CASTOR OIL.** R Castor oil, fl. ʒss; mucilage tragacanth, fl. ʒjss; simple syrup, fl. ʒss; oil orange, gtts. v. Mix the mucilage and syrup, then pour in the oils, using a bottle sufficiently large to allow free agitation, and shake violently for one-half hour. Dose: one to two tablespoonfuls.

**AN ANTHELMINTIC.** R Oil chenopodii, gtt. xxx; oil anise, gtt. vi; saccharilactis, ʒi. M *Trit., Frat., Chart No. 6.* Sig.: One or two powders every three hours. Follow at night by a cathartic. For the round worm.

**VERATRUM VIRIDE** is a valuable remedy in the violent *congestion* which *precedes pneumonia*. Indications: A full, hard or bounding pulse, with active circulation, *i. e.*, a sthenic condition. Give the small dose, frequently repeated, for effect. If treatment is commenced early enough the *congestion* will be *cured* and *pneumonia prevented*. It should be remembered that veratrum viride is not a heart depressant when given in the small dose, *i. e.*, gtts. x of the specific medicine in one-half glass of water. A teaspoonful every fifteen, thirty or sixty minutes. The question of dosage depends largely upon the individual physician. Some physicians are very successful with medicines in high potencies, while others are equally successful with low potencies. Given the remedy and its indications, the physician must possess sufficient mental power to discover such disease expressions as demand certain remedies. Some physicians have the happy faculty of doing the right thing at the right time and cure their patients with very little medicine. Therefore dosage depends upon the experience of the individual physician. Medicine may be given for its mechanical or its dynamical effect. The patient, and not the name of the disease, is to be treated. Nosological terms are of little use in the practical work of the physician; sometimes they confuse rather than simplify conditions.

**CAPSICUM** is a pure stimulant. In nervous depression, given in small doses, it is very sustaining. Capsicum and strychnia are valuable heart sustainers when indicated.



**COLOCYNTH.** Minute doses of colocynth will cure colicky pains in the abdomen and pelvis. These pains come on suddenly, causing the patient to bend double, and are *relieved* by *pressure*.

**DIOSCOREA.** Twisting, sharp, cutting pains in the abdomen relieved by *straightening out*. There is rumbling and passing of flatus.

**EUPATORIUM PERFOLIATUM.** Five to ten drops of the specific medicine in one-half glass of water; teaspoonful doses, hourly, will relieve the break-bone pains of la grippe.

**CROUP.** One teaspoonful of acetic emetic tincture in one-half glass of water; teaspoonful every fifteen minutes will cure spasmodic croup.

**PULSATILLA.** Indigestion with sensation of a foreign body lodged beneath the sternum. Also melancholia with fear of impending danger. Patient feels better in the open air.

**MONSEL'S SOLUTION.** Gastric hemorrhage from gastric ulcer, gtts. v in water, repeated half hourly as required.

**ASAÆTITA.** Flatus all passes upwards, none downwards. Hysteria.

**IRIS VERSICOLOR.** Vomiting with burning in mouth, fauces, esophagus and stomach, with profuse flow of ropy saliva.

**CALCIUM SULPHIDE** has been used many years by the homeopaths, under the name of hepar sulph. Given in material doses it *favors* the formation of pus. Given high it *prevents* the formation of pus.

**TO BREAK UP A COLD.** Take of bayberry (bark of the root),  $\mathfrak{z}\text{iv}$ ; ginger (powdered),  $\mathfrak{z}\text{iv}$ ; capsicum,  $\mathfrak{z}\text{ss}$ ; cloves (powdered),  $\mathfrak{z}\text{vj}$ ; mix; add a teaspoonful to a cupful of hot, sweetened water; a little milk makes it more palatable. This dose may be repeated every hour or two. Try a cupful of the above after taking a long drive, some cold winter's day. Useful in the chill of pneumonia.

**SCUTILLARIA.** This is a valuable remedy for nervous patients, more especially for those female patients who are passing through the climacteric. Use a preparation made from the fresh plant. Scutillaria is a bitter tonic, creates appetite, builds up the patient, and at the same time quiets the nerve centers. Try it instead of some fashionable dope. Dose of fluid extract or tincture, 15 to 30 drops.

**PNEUMONIA.** Sensation of great weight on the chest, sputa flies to pieces like batter, also streaked with blood. Phosphorus,  $6x$ , 5 to 10 drops in one-half glass of water.

**PHYSICAL THERAPY.****PHOTOTHERAPY IN GENERAL PRACTICE.\***

BY HERBERT F. PITCHER, M.D., HAVERHILL, MASS.

WHEN Dr. Oliver Wendell Holmes made the classical remark, "If all the drugs were cast into the sea, it would be well for man and bad for the fishes," he little realized that his fling at drugs would become a fact and that a large portion of his professional brethren would become drug nihilists.

I believe Osler's "Practice of Medicine" is considered by good judges of medical lore to be the best work on that subject in the English language. His definitions of disease, pathology, etiology, histology, diagnosis, and prognosis are all quite voluminous, but when he comes to treatment it is dismissed in a dozen lines or less. What does this indicate? Are the best teachers losing confidence in drugs?

Drug medication in itself has always been more or less uncertain. An old practitioner once said, "There are only two drugs of which I am sure, one is opium and the other castor oil."

We pride ourselves upon the position the family physician occupies in the world, but it is humiliating, after we have burned the midnight oil as students; toiled night and day as practitioners; run at the beck and call of the rich and poor, the good and bad; laid awake nights thinking and worrying over the ills of our patients, and perhaps be greeted the next morning with the salutation, "We have concluded to try Christian Science."

I know people are prone to run after "false gods," but it seems to me they continue to run, and, like sheep jumping over the wall, they have many followers.

We "pooh" at Christian Science, osteopathy, and other cults, but when quite a large per cent of our patients take up with that kind of foolishness, we begin to wonder why.

The same conditions may have existed in times past, but not in our time. I believe matters religious are passing through something of the same kind of evolution, and our reverend brethren complain of their parishioners thinking for themselves, and they do think to some purpose.

Our patients are beginning to think, and many of them are tired and sick of being drugged, and they are calling for a more rational treatment. Undoubtedly, drugs will always be used in acute diseases, but in the so-called chronic diseases I think other and better remedies can be used. Some great man has said, "To electrical forces and animal serums and extracts must we look in the future, in all probability, for the remedies to combat many diseases now called incurable." Looking back ten years

\* Read before the New England Electro-Therapeutic Society, Boston, April, 1906.

we can note many new and wonderful discoveries. Some of them have overturned law which seemed as fixed as the hills. Could we but look into the future a few years, our eyes would be dazzled by the brilliant achievements. Although we live in an age of progress, our knowledge is quite limited as to the real cause of many diseases.

It is only a few years since Koch made his name immortal by discovering the tubercle bacillus. Well has tuberculosis been called the "great white peril," for it has killed more people than all the wars. For ages the profession has tried to discover a remedy to successfully combat it, but until within a few years have all theories, experiments, and sinecures, one after another, been tried and found wanting. But at last a real remedy, a real sure cure, has been discovered. From the most fatal malady known, it is now looked upon as quite amenable to treatment. Some authorities claim a cure of seventy-five per cent if the disease is recognized and treated in its early stage. What is this wonderful treatment? Have drugs accomplished all this? Alas, no! This priceless remedy has always been with us, free and without price, and it was reserved for the present generation to apply it; all we have done and are doing is to open the doors and windows and let in good, pure air and the glorious sunshine. Sunlight is undoubtedly the best and most universal remedy. The ancients worshiped the sun as the most glorious object in nature, and, as the source of light and heat, idolized it as the Godhead of life itself.

"Sunlight is the most intense radiance at present known. It far exceeds the brightness of any artificial light yet invented. The calcium light and the most powerful electric arc interposed between the eyes and the sun's surface appear as a black spot upon the disk. The candle-power of the sun is said to be about fifteen hundred and seventy-five billions of billions."

I will not go into the physics of radiant heat and light, as its origin and transmission are pretty well understood.

Larkin says: "Man lives only by the radiance from the photosphere of the sun. By this great energy everything within its radius is purified, every object it penetrates is disinfected, and every known form of germ life is either destroyed or its development arrested.

"To this source can be traced directly nearly all the energy involved in all the phenomena, chemical, mechanical, or vital.

"In this solar energy is to be found the simplest and most natural method of using light therapeutically."

The inhibitory power of sunlight upon the growth of tubercle bacilli was established some years ago and is too well known to admit of discussion. Its action upon tuberculosis of the lungs, joints, bones, and glands, as well as upon bronchitis, asthma, and many other diseases, is recognized and utilized as much as possible.

In the crowded cities where the greatest need exists for radiant energy is just the place we cannot obtain it. Here we find a good substitute in the electric light.

The utility of light and heat as a therapeutic agent is now so generally recognized by the medical profession all over the world that the better equipped hospitals and infirmaries are now provided with apparatus for administering this treatment.

There are several different methods used in producing radiant light. For giving body treatments the arc-light bath and the incandescent-light cabinet are used. Dr. Cleaves, of New York, has used the arc-light bath for nearly twelve years, with great benefit in all forms of tuberculosis, many skin diseases, nervous affections, diabetes, albuminuria, and other diseases. Strebel has used it in a number of cases of diabetes with great improvement in general health and complete disappearance of sugar.

Crothers, of Hartford, has made many practical experiments with the radiant-light bath in many conditions dependent upon toxemias. His conclusions are that:

"It penetrates to the deeper tissues of the body and is turned into heat and so transformed into nerve energy more positively than administrations of dry, hot air.

"The clinical effects of the radiant-light bath prove its power as an eliminating agent, and as a corrector of neurotic, nutrient, and capillary disturbances. Its physiological action depends upon the heat and chemical rays coming in contact with substances that are resistant to their passage, and thus transforming them into heat and light energy.

"The skin is a poor conductor of heat, but readily transmits light and radiant energy. Thus in the deeper tissues it becomes changed into heat.

"Radiant energy has two marked actions on the skin and tissues, — one of stimulation and the other of sedation.

"The stimulating action falls first on the sensory, then on the vasomotor and heat centers, and lastly on the secreting centers. The vasomotor centers, controlling the constriction and dilatation of the walls of the arteries, respond very quickly to surface changes.

"Light has a special action on the vasodilators of the arteries, stimulating increased activity and permitting the blood to flow more rapidly to the surface. This takes off the burden of the heart's action and relieves the constrictions to the arterial circulation and to the capillaries. Oxidation is increased, with an increase of elimination. There is a fall in arterial tension and a uniformity in the action of the heart and respiration."

The effects of this method of treatment on arteriosclerosis are rational and beneficial. In albuminuria, Dr. Lebon has had many cases which were improved. Good results follow this treatment in rheumatoid arthritis, also in gout, rheumatism, asthma, and neuralgic conditions. In the local

application of light I have used with great satisfaction the high candle-power incandescent lamp (five hundred candle-power), using twelve amperes of current.

This lamp seems to possess the actinic or chemical rays and the heat rays — radiant heat — which are powerfully stimulating and penetrating. These lamps produce dilatation of superficial blood vessels, relieving congestion of internal organs, affording an analgesic action which is most gratifying.

When we stop to consider that the skin is capable of holding, when these vessels are fully distended, one half or two thirds of all the blood in the body, we can readily see the immense benefit we can obtain from this form of treatment.

Dr. Kellogg, in his article in Cohen's "System of Physiologic Therapeutics," shows the relation of the blood supply of internal organs to the skin. He shows how freely the vessels of the brain are connected with those of the scalp and nose, how the circulation of the middle ear is connected with the skin of the face and head of the same side through the common carotid artery. "The circulation of the internal ear, on the other hand, is associated with the skin of the back of the neck, being derived from the vertebral arteries. The vessels of the mucous membrane of the nose and pharynx are associated with those of the face and sides of the head through the common carotid. The circulation of the lungs is collaterally related with that of the skin covering the arms, the chest and the upper part of the back. The pericardium and parietal pleura of the anterior portion of the chest are connected with the skin covering the anterior portion of the chest wall through the internal artery, while the pleura of the posterior portion of the chest is related to the intercostal vessels. A collateral relation also exists between the bronchial arteries, the nutrient arteries of the lungs, and the intercostals. The skin covering the arms is related with the pleura and anterior portions of the chest through the subclavian artery, the nutrient vessels of the lungs and the vessels covering the anterior portion of the neck through the branches of the internal iliac artery."

There are still other connections which show the extensive communications between the pulmonary circulation and that of the cutaneous surface, all of which are of high therapeutic interest. The kidneys are associated with the skin covering the loins through the renal branches of the lumbar arteries. The vessels of the prostate in man, the uterus and ovaries in woman, the bladder in both sexes, are associated with the cutaneous vessels overlying the sacrum, the buttocks, the perineum, external genitals, the groins, the inner surface of the thighs and the suprapubic regions; these parts being chiefly supplied by branches of the internal iliac artery.

Space forbids extending this interesting subject. We all know the important relationship, both venous and arterial, between the stomach, liver, spleen, intestines, and even the pancreas, and the skin of the trunk which overlies those deeply-seated organs.

How well every mother recognizes the benefit following the application of a mustard paste to the stomach when the children have a pain therein, or a hot flaxseed meal poultice, or other hot fomentations to the chest when they have bronchitis. They know it relieves and does good by bringing the blood to the surface.

How much more beneficial must be a method of treatment whereby the vessels are more fully dilated than is possible by any other method except that of radiant heat which penetrates beyond the surface. It is not the heat alone which is so beneficial; it is the light rays which penetrate the tissues and stimulate the vasodilator nerves and relieve congested internal organs.

Although the technic of this high candle-power lamp is simple, there is danger in giving treatments too long and too frequently. We must remember it is a potent remedy, and evil results might follow too enthusiastic applications. Like other modalities new to the world, we should carefully study our cases and watch the effect of the treatments, being careful not to bring a valuable remedy into disrepute.

A few cases treated within the past year will illustrate its beneficial action:

A boy, nine years of age, whose ancestry on both sides was tubercular, was always a very delicate child. He had had two attacks of pneumonia and frequent attacks of bronchitis. A year ago last January he was operated upon for tubercular peritonitis, and several enlarged mesenteric glands were removed. He did not react well from the operation, and although he lived outdoors all the summer and autumn and received the best possible care, he remained weak and delicate. I saw him in October, when he returned from the country. He had an evening temperature of one to two degrees above normal and very little appetite. He was easily fatigued, had some enterocolitis, and complained of his left thigh paining him. There was some lameness in his left leg, especially at night after a little extra exercise. I ordered rest, most nutritious diet, and continued life in the sun and outdoor air when possible. As he did not improve after about six weeks, I sent him to Boston to consult an orthopedic surgeon. He said there was undoubtedly a tubercular focus in the hip-joint, and thought we had better continue present treatment a while longer.

December 15 I gave him a light treatment, and from that time he has taken two treatments per week. After six treatments there was no pain or lameness. His general health improved rapidly, appetite became good, and bowels normal. At the present time I do not know of a more rugged

looking boy; he runs and plays all day and says he never gets tired, and never felt so well in his life.

After the first two or three treatments the rays were applied as strongly as he could possibly bear, up and down the spine to the abdomen and chest, to the left hip-joint and thigh. I continue the treatment only because his people wish to keep him well through the changeable spring weather. He has not coughed nor had a cold this winter, which breaks the record for him.

A case of sciatic neuritis which had resisted other forms of treatment was cured by the light. This was a very severe case which had existed about six months. The patient, a lady fifty years of age, was very much worn and debilitated by the constant pain which had kept her from taking proper nourishment and sleep. The light was applied to the spine, which increased the general metabolism and stimulated the nerve roots.

Then the light was applied with all the heat the patient could possibly bear, up and down the course of the sciatic nerve, and especially over the sciatic notch.

A case of mastoiditis was cured in five treatments. This case, a woman, thirty-six years of age, had been treated a week by the usual remedies before I saw her. She complained of very severe pain in and around the ear and mastoid, with tenderness on pressure and pain on percussion over the mastoid bone. The membrana tympani was red and inflamed, and temperature 100.2 degrees, without chill.

Application of strong light was made over the mastoid, in and around ear, side of the face, head and neck of affected side for fifteen minutes. She returned next day with report of a good night's rest, but some pain yet. Another application, the same as before, was made. The patient said there was absolutely no pain when she left the office, and there was no pain whatever after that. She received three more applications with complete subsidence of the inflammation, and there has been no trouble since.

A man, sixty-three years of age, weighing two hundred and forty pounds, had la grippe, followed with severe pain in right side of his head and ear for three weeks. The last week the pain was so severe he could neither eat nor sleep. When I saw him he was a wreck. There was a profuse purulent discharge from the ear, the membrana tympani was ruptured, and the typical conditions with the symptoms of acute purulent otitis media. After thorough cleansing of the canal I applied the light for fifteen minutes to the painful side of the head and neck and into the orifice of the external meatus.

The patient returned next day saying that "he had had the first good night's rest for three weeks." He received six treatments, with the result that pain and inflammation have entirely subsided, discharge ceased, and the patient was feeling as well as usual. There has been no return of ear trouble.

I could enumerate many cases of like conditions and results. It is a source of great satisfaction to me to be able to relieve and even cure poor suffering humanity of a disease at once so painful and possibly dangerous to the loss of hearing and even life itself.

I do not contend that it will cure all cases of severe inflammation of the middle ear or where the mastoid has become affected, needing operative relief. But if the light could be used in the early stages it would abort the inflammatory conditions in most cases.

I have also used this light in several cases of inflammation of the accessory sinuses with equal success. When we hear patients who have suffered for days and nights from that terrible pain which is the result of inflammatory conditions confined in those narrow bony cavities like the ear and accessory sinuses, exclaim, "Oh, how good, how blessed!" we cannot help reminding ourselves of the old remedies we have used without even obtaining relief, until we found refuge in the use of morphia with its baleful after-results. I would like to relate many other cases benefited by light treatment, but time forbids.

I do not claim light as a panacea, neither should any one method be used exclusively. We should study each case individually and treat it accordingly. Because a patient has a cancer or a synovitis of the knee joint, does it necessarily prohibit him from accumulating other disorders? We would consider a man demented if he now bled all his patients, as did the physicians in the dark medical ages.

We are supposed to be broad-minded practitioners. If we think after a careful examination of our patient and in accordance with our best knowledge and judgment he needs a dose of salts, salts he should get. But if we think a "light" treatment will best eliminate the toxins and their action upon the nerve centers, that by dilating the peripheral circulation we relieve the congestion of internal organs and thereby help metabolism, that is the treatment we should employ.

If we can cure a case of acute brachial or sciatic neuritis by the application of the peculiar current or modality of electricity indicated, quicker and with better results than by the use of drugs, that is the method to use. If we are to advance with the rest of the scientific world we should put away prejudice and jealousy, open our minds to all knowledge, cling fast to that which is good and reject the bad as useless. It would be foolish to set any limits to the bounds of human power, for we live in eternal expectation of a complete and final answer to the most momentous questions of all time.

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"LET things be — not seem. . . .  
Do, and nowise dream."

— *Robert Browning.*



## THE USE OF MININ'S VIOLET RAYS IN BURNS.\*

BY ROBERT BONNEY, M.D., EAST BOSTON, MASS.

DURING the fall and winter of 1906-7, I have had a series of affections which caused me to experiment with phototherapy.

Prof. Neils R. Fensen; who employed both the electric and the concentrated solar light in his mode of treatment, is of the opinion that the curative effects of light are due to the chemical rays, and excluded the influence of the calorific rays in the treatment of lupus and allied affections.

The treatment by electric light, as a substitute for solar light, has been in vogue in America for years, *i. e.*, by electric-light baths, etc.

In 1899, Professor Minin first used his lamp which produced violet rays.

The lamp I used was practically the same as Minin's Blue Light, excepting that it was so constructed that one might use any strength varying from 16 to 350 candle-power, as desired.

In the use of this therapeutic measure, in general practice, I found a relief to suffering in cases of pleurisy and rheumatism. I have also noticed improvement with neuragias. Very frequently the first sitting causes a temporary exacerbation of pain, but the treatment should not be abandoned on this account as it is followed by brilliant results after the second sitting.

I herewith cite an interesting case which will tend to show the benefits derived from its uses.

CASE. A. McC; age, forty-nine; bridge builder. P. H. and F. H. negative.

On September 6, 1906, while he was superintending the driving of piles, the hoisting engine, near which he was standing, was overturned through some fault in the mechanism of the pile-driver. As the engine fell, it struck him and knocked him down.

The steam pipes attached to it pinioned both his wrists to the floor of the scow upon which the engine rested. The pipe which came in contact with the left wrist burst open, the steam escaping and producing a burn which extended over the left hand, arm, shoulder, and left side of neck. The right arm which lay against the steam pipe was burned from the shoulder to the elbow on the external aspect, and the upper third of the flexor surface of the forearm.

Here we have two severe burns of the third degree, one by moist heat on the left arm, and one by dry heat on the right arm.

These burns were treated in the customary manner, soothing ointments and lotions being used for thirty-seven days, when it was decided that the operation of skin grafting should be resorted to. Accordingly, healthy

\*Case presented to New England Electro-Therapeutic Association, April, 1907.

grafts were secured and applied to the left arm, covering portions of the wound from the wrist to the shoulder. One week later grafts were applied to the left hand and right arm.

Dressings, consisting of rubber dam, were placed upon the grafts. These were covered with gauze and roller bandage. Three days later the dressings were removed and it was found that all the grafts were adherent.

Believing that the application of the Minin rays might be of great advantage in the alleviation of pain and in the stimulation of repair processes, I desired to try it in this case.



FIG. 1.



FIG. 2.

Photographs. Nos. 1 and 2. These were taken about four weeks after I began the blue-light treatment. They show plainly the manner in which the granulations are covered with epithelium.

Therefore, three weeks after the last operation of skin-grafting, all other treatment was discarded, excepting the dry bandage, and Minin Violet Rays of a strength 100 to 150 candle-power were applied over the parts injured, about twenty inches from the part, giving the patient a feeble sensation of heat. A sitting lasting fifteen to twenty minutes was given every day for six months.

The progress made was splendid. At each visit, after ten minutes' treatment with the blue light, the granulations seemed to be reduced to the level of the original parts, any capillary hemorrhage that existed was easily controlled, and the tissues appeared to be covered with a light film.

This treatment was continued as described until Christmas (nearly two months), when the patient was seized with a severe attack of influenza, and because of his condition the light treatment was discontinued for a period of two weeks. During this time all the grafts, except a small one at the elbow, sloughed away, leaving a denuded surface.

When treatment was resumed the granulations were large, edematous, very sensitive, and bled readily on the slightest touch. They were also covered with pus. As soon as treatment was re-established almost immediate improvement was noticed.

The result of this treatment, up to the time of this writing, which is five months since the same was instituted, have been eminently successful and satisfactory. All the lesions described are covered with a fine white elastic skin, which is very flexible and not sensitive. There are, however, three very small areas, varying in size from a ten-cent piece to a quarter of a dollar, which have not yet healed.

There are no large bands of cicatricial tissue as are commonly seen after such extensive burns.



FIG. 3.



FIG. 4.

Nos. 3 and 4 show the arms almost entirely healed.

One can easily realize that in order to appreciate fully the character of this case it would be necessary actually to see the patient, yet I hope these photographs will give a good general idea of his condition.

The motions of both arms are free and unlimited.

In the above case it would be reasonable and just to report the benefits derived from the blue light, as follows:

It gives marked relief from pain.

It controls that disagreeable hemorrhage so often seen in granulation tissue.

It promotes the process of repair.

It dispenses with those large and cumbersome dressings, which cause so much pain and discomfort to the patient on removal.

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“IT is a high, solemn, almost awful thought for every individual man that his earthly influence, which has had a commencement, will never through all ages, were he the very meanest of us, have an end!” — *Thomas Carlyle*.

“A MAN’s honest, earnest opinion is the most precious of all he possesses; let him communicate this, if he is to communicate anything.” — *Thomas Carlyle*.

“ALL true work is sacred; in all true work, were it but true hand-labor, there is something of divineness. Labor, wide as the Earth, has its summit in Heaven.” — *Thomas Carlyle*.

“BEFORE we censure a man for seeming what he is *not*, we should be sure that we know what he *is*.” — *Thomas Carlyle*.

“THE more refined and courteous a man is, the more he will avoid in conversation a direct mention of himself.” — *Frederick W. Robinson*.

“‘OUT of the abundance of the heart the mouth speaketh.’ True; but also out of the emptiness of the heart the mouth can speak even more volubly. He who can always find the word which is appropriate and adequate to his emotions is not the man whose emotions are deepest; warmth of feeling is one thing, permanence is another.” — *Frederick W. Robinson*.

“IDLENESS is twofold, — the one in having no calling, the other in walking carelessly in our calling. The reason for this assertion is taken from the nature of man, wherein God hath placed two great instruments, — reason in the soul and a hand in the body, — as engagements of working. Besides, every gift or ability is a talent to be accounted for and improved to our Master’s advantage.” — *George Herbert*.

# DEPARTMENT OF DIETETICS

## THE DIETETIC TREATMENT OF ENTERIC FEVER.\*

BY MEREDITH YOUNG, M.D., D.P.H., D.S.SC.,

*Medical Superintendent Stockport Corporation Hospitals.*

IN enteric fever the dietary, if it is to be rational, must fulfill the following requirements:

1. It must be such that practically no solid residue, and certainly none of the least irritating character, enters that part of the intestinal tract where the local lesions are situated.

2. It must be such that fermentation of such a kind as to generate flatus does not take place.

3. Inasmuch as the whole of the digestive functions are below par, it must be one which is readily digested and assimilated.

These three requirements are moderately well understood and acted upon by physicians. Many, however, overlook a fourth and highly important necessity, *i. e.*:

4. It must be such that the various tissues are provided with proper material for the renewal of that waste of substance and vitality which inevitably occurs in all prolonged febrile processes, and especially such pyrexial conditions as are accompanied by the circulation of toxins.

The physician must, if his treatment is to be successful, pay the greatest attention to detail, and consider daily whether his patient is taking sufficient of *every kind* of food; even of those frequently neglected principles, salts and water. There must be a daily examination of feces and a careful watch kept for undigested food. If this is done there will be no need for the so-called "*antiseptic*" *line of treatment*, so vividly denounced by the late far-seeing and trenchant Dr. Vivian Poore, who stated that such treatment resulted in nothing better than the avoidance of the production of malodorous flatus.

I have tried in the most painstaking manner every "*antiseptic*" method, it is believed, which has yet been mooted. Though originally inclined to agree with their rationale, and though fondly hoping to find in them a solution of the ever-present problems in the treatment of enteric fever, I have now abandoned them as utterly irrational. In my experience neither diarrhea, tympanites, pyrexia, nor healing of the local lesions has benefited in the slightest degree, even under their prolonged and heroic

\* *Public Health*, September, 1907.

use. Indeed, this is only to be anticipated, for how much of such antiseptics given *per oram* can one hope to bring into actual contact with the inflamed patches, or the subsequent ulcers? Of that which is probably the best of the series, urotropine or hexamethylenetetramine, the writer is inclined to the view that its action is directed mainly to the kidney, and, moreover, in many patients, its use, even in doses of 10 grains thrice daily, produces in a day or two hematuria or albuminuria. I must except from my remarks cinnamon oil, which I am now trying, but with which I have not had sufficient experience to enable me to pronounce a fair opinion. When diarrhea or tympanites occurs in a case of enteric fever, the only true remedy is *a careful revision of the dietary*; this cannot be too strongly emphasized.

In cases of enteric fever where the dietary is carefully arranged, constipation usually takes the place of that diarrhea which is usually typical, but which ought not to be typical at all, and, prior to the routine use of sanatogen, I was driven to adopt the use of small simple enemata every other day in order to relieve this condition, until the temperature had been normal for about ten days, after which time such mild aperients as Apenta water or Tamar Indien were administered; but after the patient has taken sanatogen for about a week there will, in almost all cases, be no necessity for these. Naturally the use of foods which are so selected as to be almost entirely assimilated before arrival at the lower bowel tends to produce constipation precisely in the same way as the use of highly compressed or concentrated food extracts, *i. e.*, by depriving the muscular coat of the intestine of the natural excitation produced by the passage of more or less irritating undigested material. But I have found sanatogen an excellent corrective for this; and the cases are indeed rare, in my experience, where, when it is added to the dietary, resort has to be made to any artificial emptying of the bowel.

There is danger, I believe, at the present time in regarding diarrhea so much as a thing to be avoided, that constipation is rather welcomed and encouraged. Sir William Moore and others many years ago drew attention to the possibility of prolonged constipation being responsible for the occurrence of relapses by causing the retention in the bowel of what he called "fever poison," said to be subsequently absorbed by glands, which had hitherto escaped the characteristic secondary inflammation of the disease, and which, passing into the blood, set up "an essential and not a symptomatic fever."

This theory is partially endorsed by Hilton Fagge. I cannot quite subscribe to it, however, simple as it seems, for I have had cases relapse both where the bowels have acted naturally and well, either every day or every other day, and also where they have been carefully regulated by the routine administration of enemata or mild purgatives.

But, whatever the theory of the causation of relapses, — whether constipation resulting in auto-infection or not, — my own experience is that constipation is to be avoided as carefully as diarrhea.

Diarrhea, of course, may persist, owing to an atonic state of the intestinal ulcers, and is then apt to assume a most intractable form, but here again dietary is of the utmost importance in preventing this condition. Whether the adoption of a proper dietary induces a healthy activity of the trophic nerves concerned (the very existence of which is now doubted by many authorities), or whether the regulation of the diet prevents the formation of, or removes, some toxic irritant the circulation of which in the bowel is preventing the healing of the ulcerated patches, it is not possible to say. But it may be pointed out that sometimes when the most drastic remedies have failed to stop diarrhea I have found a small dose of castor oil, *plus* a careful revision of the diet, to effect a prompt cure. This would seem to point to the latter theory being the correct one.

One of the most troublesome matters to be dealt with in the case of enteric fever is the craving for solid foods, and I cannot but think that this is not merely a cry from the stomach, but it is a distinct cry from the tissues. It is one which the physician frequently hardens his heart against, and steadily plods on with milk, beef-tea, and the like, comforting his patient with promises in the meantime. In spite of the success which has attended its adoption, one does not always like to adopt the heroic line advocated so ably by Dr. Barr, and the suggestions I have to offer are, therefore, intended as an aid to the hesitating practitioner in cases in which he desires to proceed more cautiously. Of late years I have cast about for some means of satisfying this craving without going further than any cautious man would care to go, and I submit a list of dishes which I have tried in cases of all descriptions and with the best possible results. Until I hear this craving voiced I use merely the fortified whey alluded to later; so soon as the patient's voice is heard asking for more, or so soon as I see signs of deficiency in nutrition, I supplement the dietary.

1. Benger's and Mellin's foods made with or without milk, and fortified with cream, will satisfy for a time, but for a time only. So will jellies, bread crumbs, isinglass or rusks in beef-tea, light puddings, such as custard, vermicelli, cornflour, etc.

2. Bread jelly may be made by soaking a fairly thick slice of well-baked stale bread for five or six hours, then pressing out the water and allowing the pulp to simmer gently for one or two hours. Afterwards well strain through muslin, and allow the "filtrate" to set. It may then be mixed with milk and sweetened and flavored. About two tablespoonfuls of the jelly suffices for one feed.

3. Raw meat pulp must be most carefully prepared, and every trace of skin, gristle, fascia, etc., removed. A piece of the sirloin undercut is

the best part to use, and it should be scraped into small shreds and afterwards pounded up, care being taken not to lose the juice. If it has not been well scraped it may need rubbing through a hair sieve. Then it is sprinkled with salt, and again well rubbed up. It may be given in the form of little balls the size of a marble, to be eaten with a rusk, about half a dozen of such making a very satisfactory early morning lunch.

4. Junket may be prepared by adding a teaspoonful of sugar and about two teaspoonfuls of essence of rennet to a pint of fresh milk which is slightly warm; the mixture is then stirred gently and set aside in a warm place (not too warm) until the curd sets, then put in a cool place till required for use. A little cream may be added afterwards, or, if a stimulating effect be desired, brandy may be added before the rennet.

5. Suet puddings — though I have frequently heard cries of amazement when I have mentioned them — may certainly be given in cases of enteric fever within a few days of the temperature reaching normal, and in mild cases before this, if they are made with two precautions. Firstly, the suet must not be merely chopped, but must be carefully shredded in very thin slices and all fiber removed; secondly, wheat flour should not be used alone, but mixed with an equal quantity of maize. The pudding should, of course, be well cooked, and may be eaten either with sweet sauce or with gravy. The reason for the admixture of maize is that maize differs from wheat flour in not containing much gluten and, therefore, bread, pastry, or puddings made with it are more easily disintegrated and therefore more easily attacked by the digestive juices than such articles prepared with wheat flour.

6. In the matter of fish, the whiting (" chicken of the sea "), haddock, or North Sea cod are amongst those most suitable for the invalid. The fiber of the whiting is shorter and more loosely knit, I believe, than that of the others; the fiber of the sole is closely knit, and careful boiling alone will render it fit for invalid use, though it is, perhaps, the most frequently prescribed.

7. *Modified Milk Diets.* In the boiling of milk, if the rules laid down in Swithinbank and Newman's " Bacteriology of Milk " (page 10) are followed out, scarcely any alteration in flavor will be perceptible, and there will be practically no formation of scum:

" 1. Use an ordinary double milk pan, or a smaller covered saucepan containing the milk placed inside a larger one containing the water.

" 2. Let the water in the outer pan be cold when placed on the fire.

" 3. Bring the water up to boiling point and maintain it at this for three or four minutes without removing the lid of the inner milk pan.

" 4. Cool the milk down quickly by placing the inner pan in one or two changes of cold water without removing the lid.

" 5. When cooled down, aërate the milk by stirring well with a spoon."



There are many persons who pooh-pooh the suggestion that the boiling of milk in some manner changes its chemical composition. Barlow, as we all know, many years ago put forward the view that children fed exclusively on boiled milk were inclined to develop a scorbutic tendency, and now most authorities are agreed that it is not wise to ignore the idea. It is certain that any heating of milk up to 70° C. or over brings about a change in the albumin; about 70° C. it is not precipitated, but is "converted into a form which is easy of precipitation by acids, 'magnesium sulphate,' etc. A little below 80° C. the enzymes undergo a change, as may be shown by the reaction with hydroquinone and hydrogen peroxide.\*

It has been demonstrated by several observers † that the sterilization of milk destroys the lecithin contained in it, and that it loses lecithin by being heated only up to 60° C. for half an hour. Though I am one of those who hold that milk is an article intended by nature to be consumed in the raw state, yet the condition of our milk supply is such that no physician can put a patient with lowered powers of resistance on a prolonged diet of raw milk without running grave risks. Accordingly, the milk given to my enteric-fever patients (and, for the matter of that, scarlet-fever patients, too), is always boiled, and the loss of lecithin is made good by the addition of sanatogen. I have tried, but only with a fair amount of success, a mode of administering milk recommended by Brigade-Surgeon Quill, which consists in adding to each pint of sterilized milk one ounce of an alkaline mixture composed of:

Sod. bicarb.,	½ oz.
Sod. chlorid.,	60 gr.
Aqua,	12 oz.

This plan certainly has merits, inasmuch as the milk thus prepared is very slightly salt and agreeable to the palate, and, what is of more consequence, there is little, if any, tendency to the formation of large curds.

But during the past twelve months or so I have abandoned this method and trust entirely to boiled and cooled milk with sanatogen added to it in the proportion of about two grams (31 grains) to the pint. In this proportion it is imperceptible to the patient, and I feel confident it adds materially to its nutritive value. I strongly recommend it to those who are concerned with the question of milk diet, and particularly to those who have the medical care of children's hospitals. I regularly allow the addition of cocoa, coffee, and tea to the milk of my typhoid patients, particularly in the case of adults, who always find it most grateful.

8. *Traitement à Vide.* A short time ago I read with the greatest interest a description of a system of dietary in the *British Medical Journal* of December 9, 1905, by Dr. William Ewart. I studied the method care-

\*Swithinbank and Newman, p. 11.

† Berdes, Racowski, and others,

fully, and at very considerable trouble in preparing foods myself, and in instructing the nurses, carried it out in ten successive cases, beginning it as soon as they entered the hospital and continuing it for several weeks. I am bound to say that, although it has every appearance of being scientifically correct, I was not successful with it. I have not abandoned it, for I have had too much experience with typhoid fever either to praise or decry any particular method of treatment on such small data, and I feel sure that it is a method which will ultimately win its way to favor. It is certainly my intention to give it a prolonged further trial. The method consists in supplying a sufficiency of every one of the essential articles of diet — salts, organic and inorganic, carbohydrates, fats, and nitrogen, but supplying these in a soluble form and so as to leave no residue. The essentials of this dietary are “plenty of food” and “no feces.” Common salt is given in whey along with sugar (20 to 30 grains of common salt per pint of whey, and from 2 to 3 ounces of sugar per twenty-four hours); the strained juices of fruits and vegetables, or fruit jellies alone are used; nitrogen is supplied in the form of peptonized whey, by genuine artificial peptones, or by white of egg; carbohydrates are administered in the form of clarified honey and maltine, and fat in the form of cream. This diet is a little complicated and, therefore, I have followed out a similar idea, but have simply had regard to the fact that whey contains only the salts and sugar of the milk, the fat and casein having been removed. I have found it sufficient to add cream to it to make good the loss of fat, and to supply the missing casein in the form of sanatogen. This mixture is readily digested and assimilated by the weakest stomach. It contains all the necessary diet elements and makes no great demand on the nurse in the way of preparation or administration. To my mind we have thus a simple and perfect diet for the early stages of enteric fever; the only thing to be further regulated is the amount to be given, and I may say at once that for an adult from  $2\frac{1}{2}$  to 4 pints per twenty-four hours of this prepared whey is adequate.

9. *Other Useful Foods.* Though it is often rather like “taking a hair of the dog that bit you,” there is real merit in the oyster for cases of enteric fever, but I have never given more than four at a meal at the most. I have given them at all stages of the illness, except when there has been much pyrexia. Naturally, their source should be quite above suspicion.

Eggs beaten up and taken, either alone or added to milk, etc., are too well known to call for remark. It is not, however, so generally known (or at least it is not so generally put into practice if known) that cream added to soup or beef tea improves the flavor and adds to the food value. Since I discovered this by experimenting, I find that it is a fact well known to cooks who, indeed, frequently do it in the case of thick soups.

*(To be continued.)*

# EDITORIALS

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PITTS EDWIN HOWES, M.D., EDITOR.

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### PHARMACEUTIC PREPARATIONS.

EXCERPT FROM ADDRESS BY DR. SOLOMON SOLIS-COHEN, PHILADELPHIA,  
*Chairman of the delegation from the Section on Pharmacology and Therapeutics of the American Medical Association, to the meeting of the American Pharmaceutical Association.*

"FOR the last few years pharmacists and physicians, working hand in hand, have set themselves to change some of their mutual errors and mistakes of the past. It lies not in the mouth of the physician to reproach the pharmacist nor in the mouth of the pharmacist to reproach the physician. We have erred mutually, we have erred together, and we are determined to redeem ourselves together. The mere trade in patent medicines, in frauds and fakes, the deceits of all kinds, need not concern us. There are crimes outside of the ranks of medicine and outside of the ranks of pharmacy and we are not starting off on a general reform expedition. There are other organizations and other agencies for that purpose, but the movement to make the drugs — whether the product of the manufacturing houses or the product of the individual pharmacist — which are dispensed over the counter, upon our prescriptions, what they purport to be is one in which you and we have a common interest, and in which our patients have the greatest interest of all. I recognize and you recognize —

we must recognize — that in the general progress of science and the general advance of discovery, and the general progress of the arts of manufacturing and preparation of crude pharmaceuticals there is abundant room for large manufacturing houses which devote themselves to specialties of various kinds."

#### MANUFACTURING PHARMACY.

"For example, how can the individual pharmacist undertake to prepare and supply the great group of animal extracts and serums, which now have such a large part in the therapeutics of to-day? And so even with various galenicals, alkaloids and the like. There are many things which the retail pharmacist cannot do as well as that establishment which possesses the proper facilities and which is thoroughly organized to do well on a large scale what can only be done imperfectly on a small scale. We all recognize that, and the American Medical Association has taken steps, individual physicians have taken steps, to place themselves in proper relation with the great manufacturing houses, which are a credit to American pharmacy and to American business. We want to have the most cordial relations with them, so that these firms may be encouraged to prepare and offer to us for the benefit of our patients the best and purest and most definite pharmaceutical products. And yet, after all, there is a place, and there must be a place always, for the individual pharmacist, the retail druggist, call him by whatever name you please,—for the individual who practices, as a scientific man, the profession of pharmacy."

There is much common sense and practical recognition of the true status of pharmaceutical proprietaries in the above extract. The sooner this is recognized and acted upon the better it will be for all concerned.—ED.

#### BOOK REVIEWS.

ALL books reviewed in this department will be sent, postpaid, upon the receipt of the quoted price. Send money order or bank check, making payable to Pitts Edwin Howes, treasurer.

*Business Methods of Specialists; or, How the Advertising Doctor Succeeds.* An exposition of the inside workings of the complicated structure the advertising specialist has built about himself, the doors of which are seldom open to the professional investigator. By Jacob Dissinger Albright, M.D., editor of *Albright's Office Practitioner*, a monthly journal devoted to office practice, and author of *The General Practitioner as a Specialist*, a treatise on legitimate medical specialties. 16mo, pp. 112. Cloth, price \$1.25 net. Published by the author, 3228 North Broad Street, Philadelphia, Pa.

This is an exceedingly readable book and throws much light upon a subject which has been somewhat obscured in times past. No one can

scan its pages without obtaining some help therefrom, and the author deserves the thanks of the profession for the information thus given.

*Primary Nursing Technique for First-Year Pupil Nurses.* By Isabel McIsaac, graduate of the Illinois Training School for Nurses; formerly superintendent of the Illinois Training School for Nurses; honorary member of the British Matron's Council; charter member of the Nurses' Associated Alumnae of the United States; member of the American Society of Superintendents of Training Schools for Nurses; a director of the *American Journal of Nursing*; a trustee of Mercy Hospital, Benton Harbor, Mich. 12mo, pp. 197. Cloth, price \$1.25 net. The Macmillan Company, 66 Fifth Avenue, New York City.

This attractive work is filled to repletion with knowledge that will be found valuable for those contemplating the life work of nursing. Not only to those, but also to that larger army of attendants upon the sick in their own households. Physicians should buy it, read it, and recommend it to those who have charge of their patients.

*Operative Gynecology.* By Andrew Jackson Howe, A.M., M.D., formerly professor of Surgery in the Eclectic Medical Institute, Cincinnati, Ohio; author of *Art and Science of Surgery*; *Treatise on Fractures and Dislocations*, and *Manual of Eye Surgery*. 8vo, pp. 360. Sheep, \$4.00 net. Robert Clarke & Co., Cincinnati, Ohio.

It is an old saying that "a scientific book ten years old is useless." That may be true as a rule, but here and there are bright exceptions. The above is one of these. Its author was a man of rare merit and with pronounced *common sense*, which makes his writings valuable to those who have entered the profession since his work was closed.

*Immuno-chemistry.* The application of the principles of physical chemistry to the study of the biological antibodies. By Svante Arrhenius. 12mo, pp. 309. Cloth, price \$1.60 net. The Macmillan Company, 66 Fifth Avenue, New York City.

The table of contents, — viz., Chapter I, Introduction; Chapter II, Reversibility of Reactions between Antibodies; Chapter III, Velocity of Reaction — Homogeneous Systems; Chapter IV, Velocity of Reaction — Heterogeneous Systems; Chapter V, Equilibria in Absorption Processes; Chapter VI, Neutralization of the Hemolytic Properties of Bases and of Lysins of Bacterial Origin; Chapter VII, Neutralization of Diphtheria Toxin, Ricin, Saponin, and Snake Venoms; Chapter VIII, The Compound Hemolysins; Chapter IX, The Precipitins and Their Antibodies, — gives the best idea of the scope of this book.

Regarding it the author says, "I have given to these lectures the title

'Immuno-chemistry,' and wish with this word to indicate that the chemical reactions of the substances that are produced by the injections of foreign substances into the blood of animals, *i. e.*, by immunization, are under discussion in these pages." To those interested it will prove a valuable work.

*Personal and Social Purity from a Physician's Standpoint.* A brief treatise on selfial and social purity, sexual hygiene, venereal diseases, and marriage; together with a plea for public instruction in these subjects. A life book by Jerome D. Dodge, M.D. 24mo, pp. 84. Cloth, price 50 cents net. Published by the author, Collinwood, Ohio.

This little work will doubtless bring much valuable information to those into whose hands it falls. There is no question but that a wider dissemination of knowledge along these lines is needed at this present time. The medical man should interest himself in placing such a work as the above into the hands of those for whom it is especially intended, thereby contributing his mite in spreading what has been so judiciously gathered into a compact compass.

*The Essentials of Medical Gynecology According to the Eclectic or Specific Practice of Medicine in the Treatment of Disease.* By A. F. Stephens, M.D., professor of Medical Gynecology in the American Medical College; lecturer on Clinical Medicine at the St. Louis City Hospital; member of the National Eclectic Medical Association, etc. 12mo, pp. 428, fully illustrated in black and white; also three full-page colored plates. Cloth, price \$3.00 net. Scudder Brothers Company, Cincinnati, Ohio.

The first pages of this work are devoted to the description of those remedies which are especially adapted to the treatment of gynecological disease, with leading indications for their use.

The illustrations help materially in elucidating the text and thus assist the memorizing of its contents.

The treatment is in all cases clear and concise and will produce good results, while the etiology, symptomatology, and diagnosis have not been overlooked.

Without doubt the book will have a large sale and will be productive of much good for those who consult its pages. The mechanical makeup is very good, which is a *desideratum* in these days.

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"WHAT'S a man's age? He must hurry more, that's all;  
Cram in a day what his youth took a year to hold;  
When we mind labor, then only, we're too old."

— *Robert Browning.*

# Journal of Therapeutics and Dietetics

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No. 3.

## SANGUINARIA CANADENSIS.

THE season is near at hand when many people are afflicted with troublesome coughs. Perhaps there is no single wrong condition that has given rise to such a variety of prescriptions as that exemplified by the cough.

*Sanguinaria canadensis* is a remedy which should not be lost sight of, as it will prove exceedingly beneficial in many obstinate coughs which have heretofore defied all means and methods of relief.

Some of its specific indications are as follows: "Tickling sensation in the throat, or irritation of the throat with cough; bronchitis, with increased secretion; atonic conditions of the stomach and bowels, with increased secretion of mucus; throat and air passages dry, hot, and swollen; harsh and dry cough; sense of uneasiness and burning in the stomach, with nervousness; laryngitis, with cough and tickling or dryness of the throat; respiratory diseases, when the inspiration is difficult and the throat and air passages dry, hot, and swollen; sense of constriction in the throat, with difficulty of deglutition." (*Fyfe*.)

As a cough remedy, when indicated, — and the above extract shows these very plainly, — it stands unrivaled. Use of it along these lines will prove its value and demonstrate the folly of forgetting old friends.

Some prefer to use the nitrate of *sanguinaria*, but my own knowledge of the drug has been derived from the tincture — specific medicine — of *sanguinaria*. It has proved extremely valuable in my hands and has cured many obstinate coughs which nothing else could reach. A patient will frequently exclaim, "I cough, I don't know why, but somehow I cannot help it!"

Give such a one *sanguinaria* and both of you will be pleased.

In those chronic coughs which are so frequently met in the general practice of almost every physician the fact must never be overlooked that here it is absolutely indispensable to continue the medicine for a considerable period of time if the cough is to be completely obliterated. This must be *very strongly* impressed upon the patient and his coöperation secured.

Dose: Fluid extract, 2 to 5 gts.; specific medicine, 1 to 10 gts. The larger dose is emetic. Usual prescription: *R.* *Sanguinaria*, gts. v to gts. xxx; aqua, *℥iv*. *M.* *Sig.* Dose, *℥j* every one, two, or three hours. If an ounce of glycerine is substituted for one of those of water the prescription will keep better and its efficacy be increased.

# DEPARTMENT OF THERAPEUTICS

## EUPATORIUM PERFOLIATUM.

BY J. M. FRENCH, M.D., MILFORD, MASS.

**EUPATORIUM** *perfoliatum*, thoroughwort, boneset, or ague weed, is a common American perennial herb, belonging to the natural order Compositæ, and growing in low grounds and along the borders of streams throughout the United States, and flowering in August and September. The parts used in medicine are the leaves and flowering tops. The stem is round, rough, and hairy, and grows from one to five feet high. The leaves are opposite, connate-perfoliate, lanceolate, four to six inches long, tapering to a long point, and united at the base. The flowers are numerous, white, and occur in dense, level-topped terminal corymbs. The odor is feebly aromatic, the taste bitter.

The principal constituents are a bitter glucoside known as eupatorin, a resin, a volatile oil, tannin, wax, and gum. The medicinal virtues reside largely in the glucoside eupatorin.

Scudder states that eupatorin increases the functional activity of the skin, and, to a less extent, the secretion from the kidneys. It also influences the circulation to a slight extent. In quite small doses it stimulates the sympathetic system, and improves all the vegetative functions.

Potter considers it to be a bitter tonic and an efficient diaphoretic, and in full doses emetic and aperient. A warm infusion is a popular diaphoretic in remittent and typhoid fevers, also at the onset of acute catarrh or general cold. As a bitter tonic it may be used to advantage in dyspepsia and general debility.

Ellingwood regards it as a stimulating tonic, aperient, diaphoretic, emetic, and antiperiodic. He looks upon its action on the stomach as somewhat unique, differing in some important particulars from that of other stomach tonics.

According to Felter and Lloyd, the cold infusion of thoroughwort is tonic and aperient, the warm infusion diaphoretic and emetic. As a tonic, it is useful in remittent, intermittent, and typhoid fevers, dyspepsia, and general debility. They consider that it is not well adapted to ordinary cases of ague which may be cured with quinine, but is more particularly useful in the irregular cases which that drug does not seem to reach. In epidemic influenza the warm infusion is valuable as an emetic and diaphoretic, likewise in febrile diseases, catarrhs, colds, with hoarseness and pleuritic pains, and wherever such effects are indicated. In influenza it



relieves the pain in the limbs and back. Its popular name of "boneset" is derived from its power to relieve the deep-seated pains in the limbs which accompany influenza, colds, and rheumatism. If this condition is neuralgic in its character, or due to a febrile condition, boneset will relieve it. But it is not a remedy for periosteal pain. It is a remedy for the cough of the aged, in which there is an abundance of expectoration, without the power to expectorate. The cough of measles, common colds, asthma, and hoarseness, is relieved by it. In medium doses, it acts as an efficient tonic to the gastric functions, increasing the appetite and the power of digestion. The stomach disorders of the inebriate are in a measure corrected by the use of small, tonic doses of eupatorium. Externally, used alone or in combination with hops, tansy, etc., a fomentation of the leaves applied to the bowels has been useful in inflammation, spasms, and painful affections.

The dose of the infusion is from 2 to 4 fluid oz.; of the powder, 10 to 20 gr.; of the extract, 2 to 4 gr.; of specific eupatorium, 1 to 60 drops. As an emetic, the warm infusion should be drunk freely. It is non-poisonous, and there is no maximum dose.

The specific indications for the use of eupatorium are: pulse full and large, skin full and hot with a tendency to become moist, cough, embarrassed breathing, and pain in the chest; urine turbid and urination frequent; deep-seated aching pains in muscles and periosteum.

This herb, known by the name of thoroughwort, was one of the common medicinal herbs of my boyhood. In cases of fever or debility, thoroughwort tea was the remedy administered, and, according to my memory, it was usually effective. If anything was the matter with our stomachs, we were dosed with thoroughwort. The cold infusion was supposed to be the antidote to all atonic conditions under the sun. In bilious and malarial fevers it was also considered useful. I well remember that at one time an older brother came home from the army, suffering from an attack of malaria. Quinine, though dealt out with a liberal hand when it could be obtained, was scarce and high-priced in those days, and substitutes were eagerly sought. In this case, I remember the physician telling my brother that thoroughwort was one of the few native plants which possessed virtues corresponding in some measure to those of quinine; and he recommended him to drink liberally of thoroughwort tea. I cannot say whether he was benefited by it or not; but he took it, and is still alive. Pretty fair testimonial that, considering the number of years that have passed since that day.

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"TAKE care that your mind does not become too fastidious and refined. It is not a blessing but a hindrance in the work of life." — *Frederick W. Robinson.*

## SOME USEFUL REMEDIES.\*

BY PITTS EDWIN HOWES, M.D., BOSTON, MASS.

A COMPLETE knowledge of our working *materia medica* is becoming more and more important if we are successfully to combat the various forms of abnormal conditions which are constantly brought to our attention.

Each year, and almost each month, sees the introduction of new remedies to the medical profession. They come laden with high praise but are often "tried and found wanting." In our constant endeavor to keep abreast of the newer lines of medication we are apt to lay on the shelf many things which have proved useful in days past.

That this is deleterious to our success as medical practitioners cannot be disputed. There are many drugs that should be constantly kept in mind and used with more or less frequency. It is to some of this class that I desire to call your attention this evening.

Before beginning, however, I wish to say just a few words in regard to dosage. We, of to-day, are dealing with a better class of pharmaceuticals than were the practitioners of forty and fifty years ago. Our remedies are more skillfully and scientifically prepared. They represent more accurately the medicinal constituents of which they are composed. Hence it stands to reason that they must be more active and much smaller doses are necessary than were used in former years.

The subject of dosage is a broad one and might well be made the topic of an evening's discussion. To my mind, however, one rule can be laid down to which all might agree. That is, the remedy used must fall short of its toxic effect. If that is produced, either by a single dose or by a continuous system of dosing extending over a long period of time, we are doing our patients injury instead of good. For myself, I believe that the smallest amount of medicine which will accomplish the result is the goal at which we should aim, I also am certain that this is very much smaller in many instances than is generally conceded. My rule is to commence with the minimum dose and gradually increase until the correct one is obtained. Each patient, as far as dosage is concerned, stands in a class by himself and should be so considered.

*Lobelia Inflata*. This is, we might say, the "godfather" of the eclectic practice of medicine. It was one of the few remedies with which those who preceded us won many of their laurels. It is as valuable to-day as ever it was in the past and should be more often used. In these latter times we have differentiated between the use of the preparation made from the seed and that produced by treating the whole plant. For those conditions in the lung where the patients complain of tightness and a feeling

\* Read at Boston District Eclectic Medical Society, October, 1907.

of compression as if they were bearing a heavy weight, the preparation made from the seed will produce much better and quicker results. If relaxation of muscular tissue, in general, is required, the product from the whole plant must be used.

It is a query in my own mind whether minute doses of this latter preparation will not prove a good heart tonic where there is a too great muscular contraction. I mean in fraction of a drop doses (say 10 gtts. to aqua ℥iv, giving ℥i at a time) and repeated every three or four hours. Without doubt there are possibilities in this drug as well as in many others which have not been discovered and only require patient investigation to develop.

*Hydrastis Canadensis.* This is another old remedy that used to be much in vogue with our fathers in medicine.

The present high price is, perhaps, prohibitive of such extensive use at the present time, although there are some conditions where even the price of the present should not affect its use. One of these can be found in the treatment of uterine fibroid tumors. Cotton tampons, saturated with equal parts of tincture of hydrastis and glycerine, and kept in apposition with the parts—a hot douche being taken each day—will aid materially in reducing the size of the tumor.

*Colocynth.* This remedy has been used, without doubt, more extensively by the homeopaths than the eclectics, and for a longer period, in the minute or medicinal dose where it is the most effective. In old school literature it is often found added to cathartic mixtures, in doses of such size as would not admit of its specific action on the intestinal canal. Though its field of use is somewhat restricted, yet, when required, it is one of our most certain drugs and should not be overlooked. For those colicky pains which so often manifest themselves in intestinal dyspepsia where much gas is secreted and becomes lodged in various parts of the intestinal tract the use of small doses of specific tincture of colocynth is of the greatest value. For such purposes you may add specific colocynth 3 to 5 gtts. to aqua ℥iv and give in ℥j doses every half hour until pain is relieved. It is far superior to morphine and leaves no bad after-effects.

*Capsicum.* This is another of the grand old remedies that is too often lost sight of in our modern prescribing. For a *potent diffusive stimulant* it is quick and efficient, and the addition of from 3 to 10 gtts. will add efficacy and power to many of our simple combinations. In my hands it has proved of much value as an addition to many of my tonics which are given during convalescence or for the purpose of restoring anemic conditions. In such instances I usually add ℥ss to my ℥xvj mixture. My experience has proven, time and time again, that it makes them more effective, and also lessens the amount required of the other remedies entering into the prescription.

*Bryonia.* At this time of the year this remedy is almost indispensable. There is hardly a case of la grippe, pneumonia, or bronchitis where it will not be found useful, and in pleuritic affections it is one of our sheet anchors.

It acts upon the serous tissues, and results from it are very quick in manifesting themselves. Some one has pertinently said that bryonia is indicated where the person is exceeding loath to move but wishes to be left alone, as motion causes more distress.

This list might be continued so as to occupy your attention for hours, but enough has been said to show the folly of dropping old friends for new; also to show that we have remedies well tried and well proven that will aid us in our efforts to relieve human suffering when rightly adapted to abnormal conditions.

This is not only true but I also believe that useful qualities lie dormant in many, if not all, of our familiar remedies. All that they need is patient investigation and experimentation to bring them to light,.

Let us resolve, then, to delve in this fruitful soil and endeavor to add our mite to this great work of restoring abnormal conditions. By so doing will we prove of benefit to our fellow-beings and leave results of our work that will speak our praise.

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#### TABLET-MAKING FOR THE PHYSICIAN.\*

BY GRANVILLE R. JOHNSON, M.D., TEMPLETON, MASS.

THE only excuse I can offer for writing this paper is the unreliableness of some of the tablets that are on the market, which are said to contain so much of this and that drug. Again, they are frequently so hard that they will not dissolve, and thus the patient gets none of the medicine prescribed and we look in vain for its medicinal effect.

A tablet in order to produce the drug effect must be soluble, easily crushed and contain the requisite amount of drugs specified on the label.

Some ten years ago I bought of a local druggist some heart-tablets — Dr. De Costa's formula — said to contain: Nitroglycerine, 1-100 m.; tinct. digitalis, 2 m.; tinct. strophanthus, 2 m.; tinct. belladonna, 1-4 m.

I think in reality they contained only sugar of milk, or but little else, for no effect could be obtained from them and there was no taste except that of sugar of milk.

My experience with these tablets, and some others I had purchased, disgusted me so much that I abandoned the use of tablets almost entirely.

Some time after this experience — a year or more — I read an advertisement in a medical journal of a tablet machine for physician's use. The manufacturer claimed that by it tablets could be made to look as nice as any on the market.

\* Read at Boston District Eclectic Medical meeting, October, 1907.

With some unbelief, I sent for the machine and in due time it arrived. With the machine there were directions how to make tablets and some formulas.

Of course I was anxious to try and see what I could do in the tablet line. I procured my drugs and followed the directions. Lo, and behold, what nice looking tablets I could make! I could turn out from 75 to 140 per minute. Were they *soluble*? Well, I must confess that I did not get them so at first, but after some experimenting I obtained the desired object.

In making tablets we must have our drugs in a *fine* powder — the so-called raised powder is the best. After weighing the ingredients they are thoroughly mixed and moistened with simple syrup till they have the consistency of a stiff dough. The mass is then granulated by rubbing through a fine sieve, after which it must be thoroughly dried. After the granulation and drying process is completed we must lubricate the powder so that it will not stick to the tablet machine when the tablets are made. For a lubricant I use talcum powder. We must treat this powder so it will be soluble and fall to pieces in the stomachs of our patients. This may be accomplished by adding cornstarch to the powder before the tablets are made.

I will say, in conclusion, that you can get better results with the tablets you make than from those you buy and at a saving of nearly one half in the cost.

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## ALKALOIDAL MEDICATION.

BY JAMES BURKE, M.D., MANITOWOC, WIS.

FOR the study and application of the alkaloids and most other active principles of plant drug medicines a classification of these proteid forces into the principles which are used to neutralize the leucomaines in the stomach and bowels, and those that are used to round out the leucomaines stored up in the system should be made. Some of the alkaloids overlap in performing the function of rounding out some intestinal leucomaines, and their unused content is passed on to the blood and fluids of the body to take part in rounding out some systemic leucomaines.

Emetine is a fair example of this dual duty. As a rounder out of local leucomaines, it has been successfully employed in neutralizing the accrued leucomaines of the drunkard, even when the accumulation terminates in delirium tremens. In this precarious condition large doses must be given — a grain — and repeated if it is disposed of by vomiting.

Its benevolent working is manifested by healthier secretions of the intestinal glands; all the excretory organs become active, such as the kidneys, liver, and skin, because of the completion of the chemical status

of the toxins with which the emetine has combined, to make of them a complete excretory product.

It is a chemico-physical impossibility for a toxin or other leucomaine to escape from the living body through the normal channels; vicarious action of other excretory organs to rid the system of these transient poisons causes trouble for people with indifferent health, as exhibited by the skin diseases caused by trying to dispose of imperfect products for urinary excretion. The way to cure such skin diseases is to correct the faulty metabolism causing this condition and satisfying the chemical needs of the imperfect urinary products by the use of arbutin, colchicine, digitaline, or emetine, as indicated; when eclampsia is threatened, veratrine must be added. As an expectorant no small part of the benevolent action of emetine is due to its neutralization of the leucomaines of the stomach and intestines; but peculiar toxins are also stored up in the lung tissue, after a prolonged irritation of any kind, whether of a purely chemical or other nature; and they seem to be perfectly neutralized, in a great many instances, by the residue of emetine absorbed into the general circulation, after having contributed to the rounding out of certain toxins in the bowels. The toxins and leucomaines causing irritation and subsequently inflammation of the vital organs, lungs, liver, kidneys, and brain, get the bulk of their pabulum from the bowels.

If the digestion of the food proteid is not normal, the bulk of it is converted into hybrid or heterologous protein, which with the small fraction of homologous protein is absorbed from the walls of the intestines into the general circulation, where, after an effort of the blood and tissues to complete the unfinished synthesis, the most of this foreign protein is stored up in the tissues, till some agency resolves it back into the blood and fluids, where if it encounters a satisfying affinity it becomes a lawful excretory product; but, on the other hand, if it temporarily combines with a pseudo-chemical affinity, a leucomaine is formed, the toxicity of which varies under varying circumstances.

The benevolent action of emetine in cholera infantum of infants fed on cows' milk can be explained only by the fact that some molecules of its composition chemically combine with tyrotoxin and the other proteid poisons generated in a germ-laden alimentary canal; the practice of intestinal antiseptics by the liberal use of the sulphocarbolates is judicious auxiliary treatment. The chemical aggressiveness of emetine is such that it attacks the integrity of the tissues of the stomach to satisfy it, and thereby causes vomiting.

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REMEMBER — "Till we understand that there is something *due* from us, till the sense of *duty* is awakened, we have no freedom, we are not even in the way to become men." — *Frederick D. Maurice.*

## THERAPEUTIC NUGGETS.

**NUX VOMICA IN PAIN.** In paroxysmal pain around the umbilicus, with a sallow countenance and a pale tongue, nux vomica will prove beneficial. Add 10 to 20 gtts. specific tincture or a *good* fluid extract to aqua  $\mathfrak{J}\text{iv}$ , giving your patient  $\mathfrak{J}\text{i}$  doses every twenty minutes to one hour in acute cases. In those which are chronic it should be repeated every two to four hours.

**BELLADONNA IN INCONTINENCE OF URINE.** With passage of large amounts of clear urine frequently repeated, combined with inability to resist the desire to evacuate the bladder, the patient being without much force in his makeup, belladonna will give good results. Add 10 gtts. of specific medicine to  $\mathfrak{J}\text{iv}$  aqua and direct  $\mathfrak{J}\text{j}$  to be taken once in two or three hours. Marked improvement will follow.

**HYDROCYANIC ACID.** Whenever you meet with a tongue that is elongated and pointed, together with tip and edges that are red in color, the use of this acid will produce good effect. Add 5 gtts. to  $\mathfrak{J}\text{iv}$  aqua and feed your patient half hourly with  $\mathfrak{J}\text{j}$  doses until the tongue becomes normal in appearance.

**SULPHUROUS ACID.** Should the tongue present a coating that is moist and sticky, of a brownish color with fullness of tissue, this acid will be preferable to the former. It may be given in 5 to 15 gtt. doses, well diluted, every one, two, or three hours till the tongue is natural. If the coating is nasty and of whitish tinge, substitute the sulphite of soda for the acid, giving doses of 5 to 20 grs. every two to four hours.

**JABORANDI IN RHEUMATISM.** If your rheumatic patient complains of great pain that is increased by the slightest movement and there is history of scanty urine with a dry skin, jaborandi is indicated, especially if the pulse is strong and full, with considerable temperature. Prescribe 10 to 15 gtts. of specific medicine jaborandi every two to four hours, until relieved.

**CALCIUM SULPHIDE.** Do not forget this remedy in all suppurative affections such as boils, styes, abscesses, etc. Given in small doses,  $\frac{1}{16}$  to  $\frac{1}{8}$  gr. doses, every two or three hours, this remedy will abolish the condition favoring their recurrence.

**CUPRUM.** Where you wish to restore the blood after hemorrhage or in anemia with a dirty green tinge of the skin, with a clean tongue and a sweet breath, do not forget cuprum. Add 20 gtts. specific medicine to  $\mathfrak{J}\text{iv}$  and give  $\mathfrak{J}\text{j}$  every four hours.

## PHYSICAL THERAPY.

## X-RAY IN SURGICAL WORK.\*

BY GEORGE H. GRAY, M.D., LYNN, MASS.

*Apology:* This paper, now modified somewhat, was read before Essex South District Medical Society last fall. Its object was to call attention to the treatment of certain fractures, difficult or impossible of reduction by surgical operative measures, and the use of permanent buried appliances. To-night I wish to emphasize the fact that the one great stride in the handling of these difficult cases is the accurate diagnosis made possible by the use of the X-ray.

From the first demonstration of the wonderful phenomenon of X-radiation, I, as every other surgeon, was struck, not only with its applicability, but also its indispensability to surgical work. As the days go by its uses continuously multiply. What a comfort it is when a woman comes into the office with a broken sewing needle embedded in her hand, not only to make sure it is there but to locate it exactly, and save thereby an hour's hunting as some of us have previously had to do and then often failed.

Contemplate for a moment the great help of the X-ray in military surgery. Who would now think of probing for a bullet before using the X-ray if it were at hand? All now recognize the probe as a good *inoculating* instrument, as well as useful in locating foreign bodies, and, though it may start clean, it may have to enter a dirty hole and, unless carefully handled, push infection into sound tissue.

A man shows up with a sprained wrist,—his automobile kicked back; not much deformity, no crepitus, just swollen, stiff, and sore, with local tenderness over the head of the radius. Only a sprain,—a little liniment or a lotion or some of that sticky stuff called antiphlogistine, and in a day or two it will be O. K. — Don't believe it. (Illustration, No. 1.) Only the surgeon with the X-ray at his elbow realizes the frequency of these cases.



No. 1.

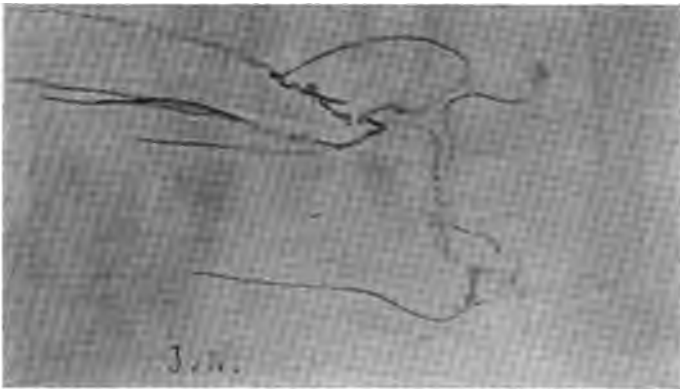
A sprained ankle shows up. It may be some hours after the injury, swelling is extreme, suffering and tenderness acute.

Who can say from physical examination of such a limb as to whether there is actual injury to the bony structure? Right here I wish to report some particular cases.

\* Read before the New England Electro-Therapeutic Association, at Boston, September, 1907.



CASE 1. Charles Nutter, aged forty-six, shoemaker. Admitted to the Lynn Hospital, January 31, 1905, suffering from an injury to the right ankle. Inspection showed the right foot everted to a marked degree, abnormal projection to the internal malleolus, much swelling and discoloration about the ankle. Palpation was not satisfactory but the X-ray clearly revealed a fracture of the fibula about one and a half inches above the tip of the external malleolus. (Illustration No. 2.) Also that the tip of the internal malleolus had been torn away. It was impossible to get decent reduction in the usual way, so after fifteen days, there being no attempt at union and the deformity seeming sufficient to disable the foot, it was decided to attempt the fixation of the external malleolus to the tibia by a screw. After careful preparation the lower end of the fibula was exposed and seized with stout forceps. It was with the greatest difficulty that it could be pulled down



No. 2.

anywhere near to its normal position, owing to the great tension of the tendons of the peroneus longus and brevis muscles.

After a long struggle and after spectators and assistants had been wearied, some of them beyond endurance, by the unsuccessful exhibition, the fragment was gotten somewhere nearly down and drilled. The first time in a direction too far behind, owing to misjudgment of the relative lateral planes of the tibia and fibula. The tibia plane is considerably to the front. When the leg is extended horizontally with the foot resting on the heel, a hole drilled in a horizontal plane passes through the posterial wall of the tibia giving insufficient hold to the screw. The second attempt proved a little better and held sufficiently to apply the cast. Wound closed without drain. No discomfort followed; patient was discharged with cast on March 20. Later, date uncertain, he reported, cast was removed, considerable motion in the joint, no pain, no trouble from the screw.

(Illustration No. 3.) Mr. Lane, of the London Hospital, who has probably done more along these lines than any other operator, reports one case of Pott's fracture in which reduction was maintained by means of a screw, but in his case the fracture of the fibula was low down on a plane nearly level with the articulated surface of the tibia and the internal malleolus was completely torn off, making this practically the larger fragment. This he fixed in position with a screw as shown in the radiograph, the restoration of the internal lateral ligament being sufficient to pull the foot into line. This could not have been done in my case owing to the small size of the fragment of the internal malleolus.

CASE II. Edward Howell, age thirty-six, building mover. Admitted to the Lynn Hospital, 1904, suffering from an ununited fracture of the right tibia. Fibula at the junction of the upper and middle thirds. This



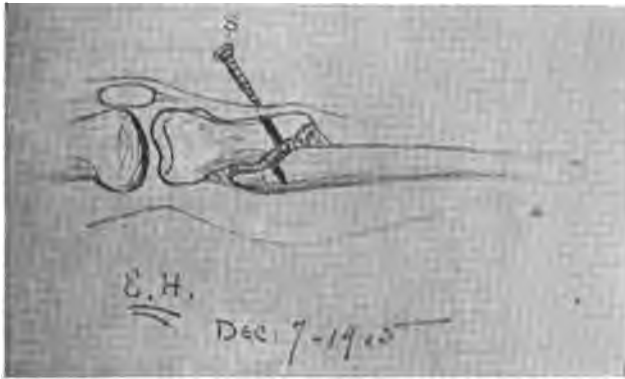
No. 3.

fracture occurred August 18 and was treated at the Lynn Hospital with the usual extension of the lateral splints till the swelling had subsided, when plaster was applied. He was allowed to go home in the fifth week with the cast still on and was directed to report the following week for its removal. Nothing was heard from him for some months.

It seems he took matters into his own hands, removed the cast himself and began and continued to get about on the leg. Soon he began to experience difficulty, and a considerable amount of motion was evident at the seat of fracture. Shortening rapidly developed till upon his second admission the leg presented the appearance indicated by the cut. (Illustration No. 4.) This was determined by the fluoroscope but no picture taken. The break was a diagonal one from above downward and forward, the anterior edge being about one and a half inches below the posterior; over-riding had taken place to nearly the extent of the broken surfaces, resulting in about one inch of shortening; a very large callus had formed and dense

fibrous union had taken place. It is remarkable that he had suffered little from this and had continuously borne much weight upon the leg without discomfort. As the leg was growing loose and the deformity greater he applied for further treatment and was easily persuaded that only surgical means could correct the trouble. On December 7 he was etherized. After very careful preparation a 6-inch incision was made just internal to the anterior border of the tibia, the middle of which was over the lower end of the upper fragment.

The skin and subcutaneous tissue were widely lifted from the bone, the fibrous broken up and the fractured surfaces freshened. The upper fragment was then drilled diagonally downward and backwards, making a hole large enough to admit a common 1½-inch steel screw without binding.



No. 4.

The bones were then pulled into position and a small hole made in the lower fragment on a line in the direction of the hole in the upper. The screw was then placed and turned tightly (care should be taken not to turn the screw too tightly otherwise the thread in the distal fragment might not hold); the effect was found to be even better than had been expected (this is really the first case operated on); the joint was firm enough to support the weight of the leg and foot. Knowing the susceptibility of the bone tissue to infection, a gauze drain was carried down to the head of the screw. I reasoned that it would be a simple matter to unscrew the thing through the drain hole, should there be any trouble. No trouble occurred. Cast was applied; window cut. Drain was removed on fourth day; stitches, the eighth; no infection; wound was clean and dry and healed, except the drain hole which was granulating. Convalescence was continuous. The patient went to work at his trade on the sixth week and has continued at his trade every working day since. The

leg is not now sound. The radiograph shows its present condition. (Illustration No. 5.) The callus is large but not so large as when operated upon. It is not tender and gives no trouble. Mr. Howell appeared at the hospital some months later and wanted a screw put in the other leg, as he asserted the fixed one was the stronger.

CASE III. E. S. Stevens, age forty-three, mason, was admitted to the Lynn Hospital, March 6, 1905, with the following history, viz., July 25, 1904, sustained a simple fracture of both femurs at the juncture of the middle and lower thirds. Put up with double Bucks extension and coaptation splints. Discharged November 23 cured (this according to the hospital record). Admitted the second time, as stated, for trouble with the left leg. Examination revealed great shortening and abnormal motion at the seat of the old fracture. The X-ray picture (illustration No. 6) speaks for itself. Operation was advised as the only possible remedy. An 8-inch incision over the middle of the front of the thigh exposed a very large callus and the over-riding fragments. The fibrous union was broken up, the ends of the bone freshened ( $\frac{1}{2}$  inch of bone had to be removed from each fragment). They were then drilled and fastened together with two links of silver wire cable, no drainage, plaster cast. Discharged May 24 with the cast on.

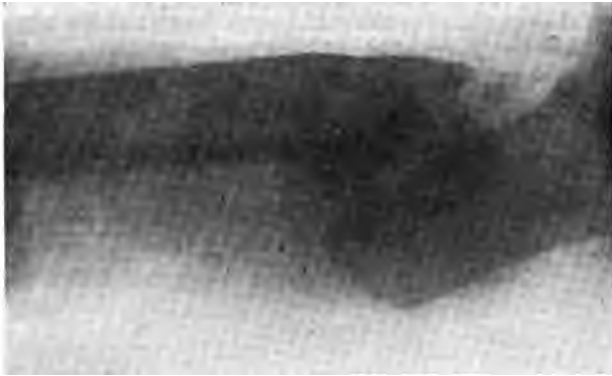


No. 5.

CASES II and III are reported in sequence because of their evidently similar pathology. Both were old ununited fractures; both diagonal breaks with great shortening; in both soft tissues were drawn between the ends of the bone making perfect reduction impossible; in each the X-ray made the diagnosis positive, not only to the surgeon, revealing to him the exact condition and making clear the necessary treatment, but also convincing the patients themselves of the only way out of the difficulty. Easy in each of these cases, as both were mechanics and the mechanism of the necessary treatment was apparent to them as soon as they saw the skiagraph.

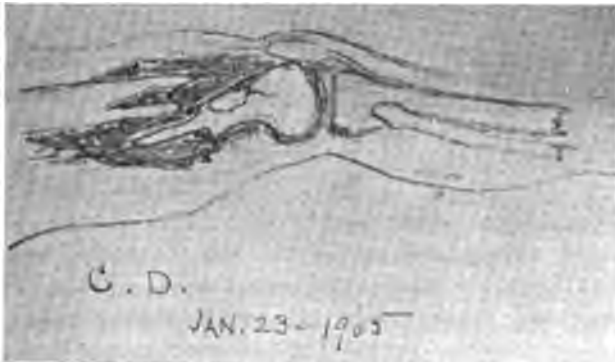
CASE IV. The following case occurred in the service of Dr. Hopkins,

my coworker at the Lynn Hospital. The treatment advised and accepted was the result of X-ray examination. Unfortunately no skiagraph was taken previous to the surgical treatment. The cut (illustration No. 7) gives a clear idea of the condition of things.



No. 6.

Charles Duntley, age thirty-seven, fireman, January 15, 1905, during the fire at the Washington Street church, sustained a simple fracture of the humerus at the junction of the middle and upper thirds and a simple comminuted fracture of the femur at the lower third, both caused by falling



No. 7.

timber. He was brought immediately to the Lynn Hospital and admitted to the service of Dr. Hopkins. The arm was easily reduced and put into coaptation splints for eight days, when plaster was substituted and this gave no further trouble. The fractured femur could not be reduced by

manipulation and was kept in heavy extension for eight days. During this time repeated attempts were made to overcome the  $2\frac{1}{2}$  inches shortening and the short angular deformity with positively no success.

After the condition had been revealed to him by the X-ray, at his own request ether was administered, the leg very carefully prepared and an incision, as shown in the cut, along the outer border of the rectus was made and carried rapidly down through the external vastus. A tremendous amount of extravasated blood was found, seemingly a quart of black clots were scooped out. A long sharp spine of the lower fragment projecting



No. 8.

upward, outward, and backward had badly lacerated the muscle. Beyond this and projecting forward could be felt two long spines of the upper fragment. Between the two a band of torn muscle lay and it was this that prevented the dove-tailing ends from being brought into position. Small loose pieces could be felt nearly detached from the inner border of the lower fragment. One, the size of a twenty-five-cent piece, was removed through a counter opening. It was only with the greatest difficulty, after the band of torn muscle had been cut, that the leg could be extended and the ends brought into position. As it was, the spines had to be trimmed.

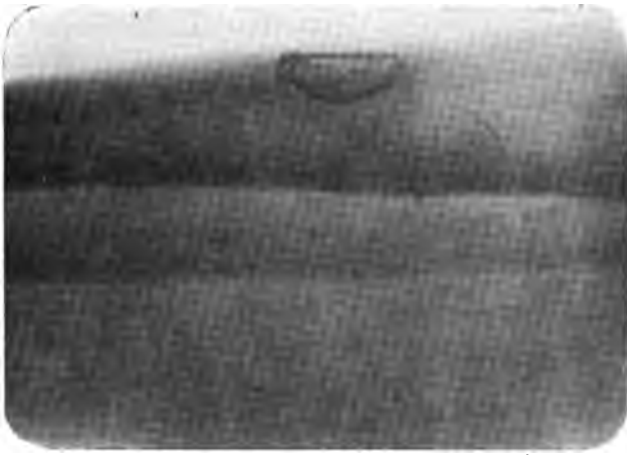
This accounts for the small amount of shortening, — three fourths of an inch.

The bones were drilled as per cut, and wire cable introduced and twisted, and though the line was not perfect it was not bad. The external incision was closed, the internal drained with gauze, plaster cast applied, and window cut over the drain. The operation was a long one and the patient suffered much from shock, which, however, passed off after twenty-four hours, and from then convalescence was steady and uneventful. The X-ray (illustration No. 8) shows its present condition. A straight sound femur, a little less than three fourths of an inch short. It seems clear that non-union would have been inevitable leaving a condition similar to Cases II and III.

CASE V. Walter Barry, age fourteen, schoolboy, sustained a com-

pound fracture of the tibia, by running into an electric car while coasting. This was opened up, cleaned and wired with silver cable and he made an uninterrupted recovery. The radiograph (illustration No. 9) shows the present condition of the bone, and the boy was in Salem to speak for himself.

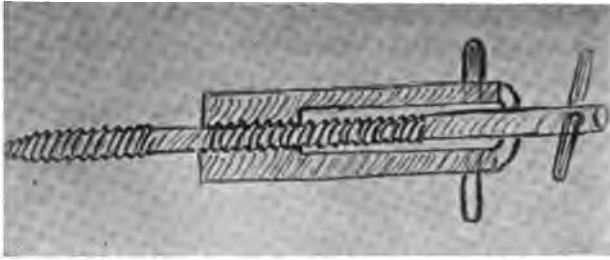
After giving due credit to the help of the X-ray in the diagnosis of the exact pathology and indicating the necessary mechanical treatment of these cases, it may not be out of order to discuss some points of surgical detail. During the service in which these cases occurred, I found no time to look up the literature of the subject and had no knowledge that screws had been used for similar purposes before. My library text-books had very little space devoted to buried appliances in the treatment of fractures. That the ground was new I was loath to believe. Solomon says, "There



No. 9.

is nothing new under the sun," and one who doubts it has only to vent his new ideas to find they are as old as the hills. In the limited time at my disposal I learned that as long ago as 1805 Hereau proposed wire and, in 1857, Pancoast screws, for the treatment of fractures. This appliance (illustration No. 10) is not new, as I hoped it might be, but was invented by Gaillard (illustration No. 11), back in the sixties. Goldthwait of Boston has used wire nails in the treatment of fractures where splints were insufficient to retain the fragments in position, and having charge of the after-treatment of one of his cases in which nails had been used suggested to me that the screw would be a much better mechanical device and should cause no more irritation when buried in tissues. If it is justifiable to attempt surgery in an ununited fracture and to fix a loose femoral head as Goldthwait did, why is it not feasible and justifiable in cases difficult of reduction, or where reduction cannot be maintained, to operate

sooner, as soon as the facts can be discovered? The pathology can be laid bare by the X-ray, and does it not seem that the screw would be the more effectual appliance and necessitate less extensive dissection? Gross in his system of surgery, vol. i, page 931, says, speaking of ununited fractures, "Connecting the ends of the fragments together subcutaneously by means of an iron screw, as originally done by Pancoast in 1857, often succeeds where



No. 10.

more ordinary plans fail. Eight successes he reported in eight cases." If these results could then be obtained, what should reasonably be expected to-day with our X-ray diagnosis and perfected surgical technic? Speaking of non-union, Macurdy, of Pittsburg, says, "It occurs once in 500 cases," certainly not a large per cent. From some of the crooked and deformed limbs seen one might wish it happened oftener. Then an accurate diagno-



No. 11.

sis would be made and the limbs treated surgically. Cause of non-union as stated in a recent work are, first, local, and, second, general or constitutional. How rarely do we see cases in which general or constitutional causes play the important rôle, and do we not all see cases in which the impossibility of reduction and maintenance is the determining factor? With the X-ray, is it not probable that in the vast majority of cases the



exact condition can be learned at once, and a reasonably certain method of treatment instituted?

The local conditions responsible in the main for deformity, disability, and non-union are:

*First.* The interposition of soft tissues, periosteum, fascia, muscle (as in Dr. Hopkins's case). The wide separation of the fragments as revealed by the X-ray indicates this.

*Second.* Extremely diagonal breaks, offering no resistance to muscular retraction, producing extreme shortening. The X-ray clearly reveals this condition.

*Third.* Breaks parallel to the direction of greatest muscle pull, viz.: fractures of the neck of the humerus or femur.

*Fourth.* Wide separation of fragments as in fractured patelæ.

Do not such cases call for more serious consideration from an operative standpoint and at an early date?

One may well hesitate about advising resort to surgery by any but those best trained and of known mechanical skill, knowing how very susceptible the bone tissues are to slight infections. Nothing not surgically clean must touch bone tissues or the results are jeopardized. Still, with rubber gloves, and thick ones too, or, what is better, touching the tissues with nothing but boiled instruments and steamed gauze, with good mechanical ideas one ought to succeed.

Macewen, of Glasgow, with whom I discussed this subject and who does as much, perhaps more, bone surgery than any other man, does not advise gloves, says they will get cut or torn, and there is danger of it. Yet I believe every man ultimately works out a perfectly safe technic for himself, if he is a successful surgeon. To that he should stick, and not try to cram it down the throats of others. It is not so much the particular kind of technic as it is the thoroughness of any good one.

Mr. Lane, of the London Hospital, who has done such a large amount of work in this line during the last few years and some of whose cases are shown on the screen, says (*British Medical Journal*, November 18, 1906), "The operative treatment of fractures with buried appliances is comparatively simple in the majority of cases. Due care being taken and reasonable skill being employed, the risk is practically nil."

A few words about wiring, apropos of cases reported. The only point I wish to bring up in this connection is the use of a twisted wire cable instead of a single strand. It is much stronger, weight for weight, is in a sense elastic and will not break so easily in fastening. Each link should be doubled and twisted separately, thus securing one blunt smooth end not liable to catch in the drill hole, an end which can also be spread open and threaded with silk from a needle, thus facilitating insertion in awkward places.

Until more convincing arguments are advanced to the contrary, with the X-ray to back up the diagnosis and indicate the necessary procedures, I shall urge the operative treatment of simple fractures difficult of reduction, believing that not only will non-union result less frequently, but also that there will be much less deformity and much time saved in convalescence.

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"EVERY one has some work to do. Every one has inducements to forsake that work for things which, whether pleasant to others or not, are pleasant to him. Only there is something in him which says, 'I ought not.' The agreeable thing will hinder me from doing the thing which I am occupied with. The agreeable thing accepted to-day will make me weaker to-morrow, less capable of determining my course, more the victim of the impulses and impressions that come to me from without." — *Fredrick D. Maurice.*

"ALL men accustomed to investigation know that it is a great step when we are personally quite certain we do *not* know." — *John Ruskin.*

"By right discipline we can increase strength." — *John Ruskin.*

"IN general, *pride is at the bottom of all great mistakes.* All the other passions do occasional good: but whenever pride puts in *its* word, everything goes wrong, and what it might be desirable to do quietly and innocently, it is morally dangerous to do proudly." — *John Ruskin.*

"KNOWLEDGE is mental food, and is exactly to the spirit what food is to the body. . . . Therefore, with respect to knowledge, men are to reason and to act exactly as with respect to food." — *John Ruskin.*

"THE memory ought to be a storeroom. Many turn theirs into a lumber-room. Nay, even stores grow moldy and spoil, unless aired and used betimes, and then they too become lumber." — *Augustus Hare.*

"EVERYBODY has his own theater, in which he is manager, actor, prompter, playwright, scene shifter, bookkeeper, doorkeeper, all in one, and audience into the bargain." — *Augustus Hare.*

"WHEN a man says he sees nothing in a book, he very often means that he does not see himself in it; which, if it is not a comedy or a satire, is likely enough." — *Augustus Hare.*

REMEMBER, "Life is a business, not good cheer." — *George Herbert.*

# DEPARTMENT OF DIETETICS

## THE DIETETIC TREATMENT OF ENTERIC FEVER.\*

BY MEREDITH YOUNG, M.D., D.PH., D.S.SC.,

*Medical Superintendent Stockport Corporation Hospitals.*

*(Concluded from page 60.)*

GLUCOSE forms a very useful addition to beef tea (one teaspoonful to about ten ounces), and frequently patients take a decided fancy to it. I might add that it is an excellent food for any one who has hard mental work to do and wants an easily assimilable article; the glucose has a splendid emergency food value.

10. Gelatin has been recommended by Dr. R. M. Harbin † as a useful dietetic adjuvant in enteric fever. According to Dr. Harbin, gelatin "serves three purposes: it adds to the relish of the various liquids, lessens the nitrogenous waste from the system, and prevents hemorrhage." Its nutritive value, however, is said to be *nil*, and it acts, like all albuminoids, merely as a sparer of the albuminates.

11. In the matter of fruits and vegetables choice must be made with the very greatest care. Such things are usually omitted entirely from the dietary of enteric fever, but I think if they are, something should always be done to supply the organic acids in another form. I have almost always given lime-juice, or the strained juice of other fruits, as a daily drink, but latterly I have very gradually and cautiously admitted vegetables and fruits themselves to the list of permissible articles. The following, when carefully selected, prepared, and cooked, may be given: the white core of cauliflower, asparagus, the pulp of baked apples, very young or forced rhubarb, potatoes, vegetable marrow, etc. All of these leave more or less solid residue, but of a kind which I do not think is hurtful to the alimentary tract.

12. *Drinks.* The question of drinks is one which frequently calls for the exercise of considerable ingenuity on the part of the physician. Cold water I always allow in abundance, provided it is not given at such times, or to such an extent, as to unduly dilute the digestive juices.

A most agreeable drink, and one which has a distinct food-value, may be made from apples. To make it, cut up a pound of apples into quarters, add half a pound of sugar, place in a bowl, and pour over the mixture half a gallon of boiling water; allow this to stand till cool, and then remove the apples, which are now softened, and pulp them. Pour the fluid from the

\* *Public Health*, September, 1907.

† *Medical Record*, November 9, 1904.

bowl over the pulp, mix well, and allow to stand for an hour; then strain carefully. For a parched palate there are few drinks more grateful than this.

In the preparation of all foods and drinks containing sugar it is wise to make a *solution of sugar* first, and allow this to settle for about six hours; then decant off all except the bottom portion. This bottom portion will, in the case of most sugars, and especially the white crystallized varieties, be found to contain a fine sediment, which is composed mainly of *ultra-marine*, a substance added to give the sugar a dazzling white appearance. The composition of ultramarine is somewhat as follows, according to Mr. W. Thomson, of the Royal Institution Laboratory, Manchester, to whom I am indebted for the information:

Silica,	37.90
Alumina,	29.30
Soda ( $\text{Na}_2\text{O}$ ),	22.60
Sulphur,	7.85
Earthy residue,	2.35
	<hr/>
	100.00

Again, in the making of barley-water, I would strongly advise the frequent and thorough washing of the barley beforehand, for it is usually whitened artificially by being coated with mica.

These two things, ultramarine and mica, are closely allied in chemical composition; and I submit that the introduction of such substances into an inflamed and possibly ulcerated intestinal tract can only be productive of mischief. My attention was first drawn to the point by a manufacturing chemist in this town, who stated that even when the finest white lump sugar was used in the preparation of syrups he could not prevent the occurrence of a certain muddiness which was detrimental to the appearance of the syrups, and which he ascertained to be due to ultramarine.

*Copious water drinking* has been tried, and apparently with success, by Drs. Cushing and Clarke at Cleveland, Ohio. Four ounces of aq. dest. were given every fifteen minutes during the waking hours, each patient taking from 8 to 14 pints every twenty-four hours. Patients had, besides this, 6 oz. of milk and 6 oz. of albumin water every two hours during the day, and once or twice during the night. The amount of urine passed was very large — from 8 pints up to 2 gallons per twenty-four hours. Treatment by cold baths was carried out at the same time in some of the cases. I am bound to say the system does not commend itself to me; the results indicate that there was less headache, restlessness, and delirium, but relapses and hemorrhage were about the same as in other cases not put on the water diet, and the febrile period lasted equally long in both

classes of case; the mortality was only half in the water-drinking cases of what it was in the others, but mortality figures in enteric fever are always to be accepted with great reserve.

13. On the question of alcohol I fear I can say little or nothing new. I firmly believe in saving it up until one has definite signs that the system needs outside help. On the appearance of any odor of alcohol in the breath I follow, I think it is Sir William Broadbent's advice, and stop its use. In the case of patients over forty, or in what one might term "young-old" people, it is wisdom to begin its use early enough. An excellent way of administering it is to give 20 drops of spiritus camphoris in a small glass of port wine. During convalescence it is difficult to determine when to stop its use, but I have been able to discontinue it at a much earlier period in cases where the patient has been taking sanatogen in his milk or soup for ten days or so; in fact, such patients scarcely seem to require alcohol at all; the sanatogen takes its place. I believe that alcohol is not at all a good thing for patients who present that marasmic condition alluded to later; I have more than a few times found patients so suffering make a complete recovery when the alcohol was discontinued.

One may suspect that the strain of the disease is playing havoc with the heart muscle when one gets a transversely enlarged area of precordial dullness, an outward displacement of the apex beat due to engorgement of the right chambers, general or local anasarca, rapid and compressible or dicrotic pulse, and a short and feeble first heart sound, and one must never forget the possible consequences of this degeneration of cardiac strength in the occurrence of hemorrhagic infarcts of lungs, spleen, kidneys, etc., and venous thrombosis, together, of course, with malnutrition of areas of distant blood-supply. It is only reasonable to suppose that this decrease in the functional activity is due primarily to the action of toxins, but I cannot but think that defective nutrition considerably aids it, and, therefore, when I see any signs of its occurrence I at once cast about for some mode of improving the dietary. The one cause is beyond our control, but with the other it is in our power to do something. Other indications for alcohol as a temporary adjuvant and for careful inquiry into the dietary are afforded by the existence of constant restlessness, delirium, or sleeplessness, accompanied by feeble pulse, dry, brown tongue, and tremulousness, or of a continual feeling of depression and exhaustion. Pure grape brandy is undoubtedly one of the best forms in which to administer alcohol, though in many cases champagne alone appears to do good. Many is the time that I have secured for a patient on the verge of violent delirium a comfortable night's rest by the administration of brandy punch. (Here, by way of parenthesis, I should like to remark that for a condition of this kind it is unwise to use any but the most carefully prepared tincture of *strophanthus*; I have tried some which, even in large doses, had apparently

no effect at all, and I have tried others which even in small doses produced an irregular, infrequent, and weak pulse, the result of over-stimulation of the cardiac ganglia and myocardium. Now I use only Sir Thomas Fraser's mixture, or that prepared by Parke, Davis & Co., as, so far as I can ascertain, these are the only two reliable ones on the market, though there may be others I do not know of.)

*Marasmus.* To my mind nothing is more disheartening than to find, on the close of the acute stage of the illness, convalescence interrupted, it may be for months, by the occurrence of what can best be described as marasmus, *i. e.*, a progressive emaciation with anemia, and a sustained general low vitality, which at times renders the patient an easy victim to tubercular infection. Fortunately, the complication is comparatively uncommon, but I have quite recently had three very troublesome cases of it following close upon one another, and in which I have had most beneficial results from the preparation to which I have already drawn your attention.

CASE I, was that of a male patient, age twenty-seven, who confided in me that prior to marriage he had led a dissolute life, and was even now tainted with syphilis. He had also a very doubtful area under his left clavicle, which I could never quite satisfy myself was not tubercular. Several examinations of the sputum all yielded negative results. Recovery from the acute part of the illness was obtained slowly in about four and one-half weeks, but after that the patient did not seem to progress. The usual auxiliary food-stuffs had practically no beneficial effect; cod-liver oil, virol, hypophosphites, malt extracts, hemoglobin preparations, all failed of their usual effect.

Finally, I determined to try some of the extra-pharmacopeial remedies, and began on plasmon with considerable hope, but after a fortnight's trial, checked by careful weighings, etc., I found no appreciable benefit. Next, I tried a preparation containing lecithin (ovaltine) for eight days, again with no apparent benefit. Finally, I tried sanatogen, at first given in small doses in ordinary foods, but after a week increased in dose, and given separately in water or milk. At the end of the twelfth day the patient's weight and strength had materially improved. As he was in a fit state to be discharged from hospital, I carefully instructed him in the preparation of the substance, and asked him to take it regularly, and let me know how he progressed. I heard from him three weeks afterwards in person; he then was, and had been for ten days, at work, and was looking perfectly healthy; he informed me that he had gained 5 lb. in weight in the last fortnight, weighing himself on the scales in his shop.

CASE II. Nurse E., aged twenty-eight years. This patient was very anemic and stated that she had always been so since she could remember. The illness commenced very gradually indeed, and with symptoms so vague that its nature was only cleared up by obtaining a Widal reaction.

Subsequently, a typical attack developed. The patient, though like many nurses, somewhat fanciful in her choice, took food readily, and was usually eager for it, but it infrequently caused slight indigestion of a flatulent type, and on two occasions, diarrhea ensued which, but for a careful watch on the temperature, I should have put down to relapse. The patient's strength, however, did not return, and her weight remained stationary. I again tried various auxiliaries to ordinary diet, but with no visible good result. Sanatogen was tried over a period of sixteen days whilst she was in hospital, but did not quite come up to my expectations, for during the last week in hospital she lost  $1\frac{1}{2}$  lb. in weight. I determined then to send her away to stay with some friends at the seaside, and on my advice she went there, and took sanatogen regularly for nearly a month; on her return, a few weeks ago, she had gained 13 lb. in weight, and was looking the picture of health; her anemia had so completely disappeared that, as she said, "her complexion did not now seem to suit her."

CASE III. Male, aged forty-eight. Occupation, cotton doubler. Commencement of attack very atypical; no Widal reaction obtained till about twelfth day, and then only with the third blood specimen, the first two giving negative results. The day after admission the nurse reported blood in the sputum, and a careful examination of the lungs resulted in the discovery of a fairly large phthisical cavity in right lung. The sputum was subsequently found to contain large numbers of tubercle bacilli. The course of the fever was uneventful. Patient was left in a most hopelessly emaciated condition. He took food well, and had an excellent appetite at first, but after a little while this dwindled, and he often left half his food untouched. I tried capsules of oleum morrhue c. creasote, virol, various emulsions of cod-liver oil, and other things, with a little, though not marked, success. Finally, I put him on sanatogen, which I had carefully prepared with thick, creamy milk, and I submit a comparative statement of his progress during the seven weeks of convalescence that I had to deal with him. (I may say that as he came from a very poor home, and was so utterly unfit to be sent back there on account of his weakness, I kept him in hospital an unusually long time.) Height, 5 feet, 6 inches.

	Weight in Pounds.	Treatment.
Beginning of first week,	88	
End of first week,	89 $\frac{1}{2}$	Cod-liver oil and creasote.
" second week,	90 $\frac{1}{2}$	" " (emulsion).
" third "	93	Virol.
" fourth "	94	"
" fifth "	97	Sanatogen alone.
" sixth "	101	" "
" seventh "	105 $\frac{1}{2}$	" "

As the patient was then sufficiently convalescent for discharge I sent him home, and gave him some sanatogen to take with him. He weighed

himself at my request at the end of eight days at a railway station, and informed me that he recorded 115 lbs. Being doubtful of the accuracy of this weighing machine, I weighed myself on it a few days later and checked the weight on the hospital scales, finding it (as one often does with such machines) to the advantage of the individual to the extent of  $2\frac{1}{2}$  lb.; thus the actual increase during the eighth week would be 7 lb. Since then I have lost sight of the patient. Still, an increase from 94 lb. to  $112\frac{1}{2}$  lb. in four weeks, occurring in a patient suffering all the time from an active and extensive tubercular lung affection is, in my opinion, most remarkable. During the whole of this time the only other medicine taken by him was small doses of heroin to relieve the hacking cough.

One other case deserves special mention, though it does not come in quite the same category, namely, that of a girl aged ten (one of a family of five who all had most severe attacks of enteric fever). This child passed through a dangerous illness, having three very severe hemorrhages and two unaccountable relapses. She was suffering from pronounced rickets with thickened epiphyses, badly curved tibiae, caput quadratum, etc. For a considerable time after the cessation of the fever diarrhea continued, and much of the food given was present undigested in the feces. In spite of attempts to feed the child up she continued in a state of really pitiable debility and marasmus, reminding one, as the nurse in charge remarked, of one of the sad pictures of the Indian famine children. It was evident that the nutritive functions, to use a compendious phrase, were completely deranged. She was tried with raw meat juice, virol, iodide of iron, lactophosphates, cod-liver oil, and even with glycerophosphates of the ordinary type, but with little or no benefit. At the end of the fourth week of convalescence she could walk only a few yards by the aid of holding on to furniture. I determined to give sanatogen a trial, but at first she only took it under protest, saying she did not like the taste. But beginning with small doses, and giving it at first in well-sweetened cocoa, and then in milk with cream and sugar added, she became fond of it, and eventually was able to take it made into a thin paste with plain water. The change in her condition at the end of a fortnight was truly wonderful. Appetite was improved, diarrhea had completely stopped, the cheeks were rosy and beginning to fill out, her weight had increased by 1 lb. 10 oz., and she was able to walk the whole length of a long ward without any assistance. I kept her on the treatment another fortnight, and was then able to send her home, a bonny, well-nourished child. I have seen her several times since, and though her parents have not been able to afford the continuance of the sanatogen, she has gone on improving; the substance appeared to have corrected a degeneration or aberration of metabolism, and now she is able to extract the necessary nourishment from ordinary food substances.



Having spoken so highly of sanotogen, I should say that it is stated to be a combination of pure casein or milk-albumin (ninety-five per cent) with glycerophosphate of sodium (five per cent); it thus contains a large amount of soluble proteid matter with a quantity of organic phosphorus. This organic phosphorus it is, in my opinion, which makes the substance of such value as a metabolic stimulant, if one may use such a term. "Phosphorus enters into the proteid constitution of tissue just in that portion of the cell which is responsible for multiplication and reproduction, i. e., it is the nuclei of the cell which contain the phosphorus." (Dr. Snowman, *Birmingham Medical Review*, September, 1905.) Phosphorus enters into the composition of the lecithins as glycerophosphoric acid, and lecithin exists not merely in nervous tissue, but also in red and white blood corpuscles, etc. In supplying an easily absorbable phosphorus compound, therefore, we are not merely making good what has been lost in the heating of milk, but we are supplying a want of many tissues. The substance is readily taken up by the stomach (Drs. Tischer and Beddies of Berlin found 3 gm. completely absorbed in fifty-five minutes), even in diseased conditions. The phosphorus contained in sanotogen is practically entirely assimilated by the system (Professor Tunncliffe, *Archives Internationales de Pharmacodynamie et de Thérapie*, Vol. XVI).

I firmly believe that by the regular use of sanotogen in enteric fever we shall prevent the occurrence of that extreme wasting and debility going on to actual degeneration of the Zenker and Hoffman type, which is so frequent, and which is so desperately hard to combat.

I should like to say, in conclusion, that I have allowed myself to laud this proprietary product only because I feel that it is every one's duty to do so, when he has thoroughly tested any such thing, and found it to fill such a distinct gap as I am sure this does. It is all very well to stick to the Pharmacopeia and Mrs. Beeton's Cookery Book,—if one may utter the two in the same breath,—but there are excellent things outside both, which the physician has to find out for himself. ¶

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"PLEASANTNESS of disposition is a great key to do good; not only because all men shun the company of perpetual severity, but also for that when they are in company, instructions seasoned with pleasantness both enter sooner and root deeper." — *George Herbert*.

"ASPIRE, break bounds! . . .  
Endeavor to be good, and better still,  
And best. Success is nought, endeavor's all."

— *Robert Browning*.

# EDITORIALS

## Journal of Therapeutics and Dietetics

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PITTS EDWIN HOWES, M.D., EDITOR.

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### PHYSICIANS AND THE PURE FOOD AND DRUGS ACT.

"A most excellent article by Prof. John Uri Lloyd, published in the *Eclectic Medical Gleaner*, upon the scope of the Pure Food and Drugs Act, calls attention to the fact that physicians are interested and more or less directly affected by this act.

"It is the duty of pharmacists who dispense for interstate business to see that preparations which comply with the law are employed, and to obey the law relating to the labeling of their newly made packages.

"A very large number of states have provided laws quite in accordance with the federal law, in making it imperative that every item be purchased in an original unbroken package. That in the case of drugs, the label shall bear the actual assay with the assay figures printed on the label in the location and in the size of type demanded by the law.

"No dispenser knows when he will be required to prepare a preparation to be labeled for interstate commerce, and the law applies particularly to alkaloids, alkaloidal preparations, alcoholic preparations, and substances named in Regulation 28.

"Physicians and pharmacists should take no broken packages of the drugs named in the law. Indeed, it is best to secure original packages of

everything possible. An unbroken package or a strip label carries no manufacturer's responsibility.

"Professor Lloyd advises all to order original packages of drugs, and if not in stock order that the same substance in the next nearest size original package be sent.

"Professor Lloyd also calls attention to the fact that the law prohibits all forms of imitation and counterfeit; that the law seems to apply particularly to imitations of established brands, as well as substances designed to replace genuine drugs and chemicals. The sale of these is forbidden under the law.

"Professor Lloyd also calls attention to the fact that the careless corking of alcoholics or evanescent substances will soon change their assay percentages. Alterable alkaloids, and many organic products, will change by air contact. Dispensers will be required to prove the integrity of their mixtures, and unquestionably preserve them, if a manufacturer assumes the risk of the retailer's penalties. The manufacturer's guarantee concerns the unbroken package used in interstate business, and the Government does not consider an opened package a manufacturer's responsibility.

"Professor Lloyd advises the keeping of all articles in bottles securely corked by means of new corks. On opening a bottle if the cork is spoiled, throw away the fragment and refit with a good, new cork. Then see that the cork is tightly replaced each time a part of the material is removed. He suggests that it is better to stock four one-quarter pound vials than a single pint bottle of any substance, unless it be very stable or used quickly.

"Every prescribing physician in America deals more or less in the articles mentioned in Regulation 28. Whoever transports across a state line an original bottle of the restricted alkaloids or alkaloidal drugs, the coal-tar products or their derivatives, chloroform or alcoholic preparations, is employing the articles regulated by the Government, and must see that they are properly labeled. It is therefore the duty of every physician to know just what to do, and it is his privilege as a good citizen to conform to the law.

"Attention is called to an authoritative ruling made by the department as follows:

"'If a package compounded according to a physician's prescription be shipped, sent, or transported from any state, or territory, or the District of Columbia, to any other state, or territory, or the District of Columbia, by a compounder, druggist, physician, or their agents, by mail, express, freight, or otherwise, the label upon such package is required to bear the information called for by Congress.'

"Every filled prescription or mixture sold, if mailed, expressed, or shipped across a state line by common carrier, must have the amount of

each ingredient named in Article 28 plainly stated upon the label, if any such be a constituent.

"Many states have already adopted laws based on the Government Act; many others are preparing to do so, and as each state does this, the state law applies to adulterated, misbranded, or sophisticated drugs inside that state, as well as to the territories and interstate commerce.

"Whilst manufacturers are required to print in large type, eight-point caps., the names of the ingredients enumerated in the act, practicing physicians are allowed to write these amounts on their labels with pen and ink, or a typewriter, provided that such written matter is distinctly legible, and on the principal label, as prescribed by the regulation.

"Family or office practice inside a state is not affected. Physicians can fill prescriptions as usual, from old or new stocks of medicines, if they do a legitimate family or office practice inside a state, providing no state law interferes or otherwise regulates the method of prescribing or the medicines prescribed.

"Practicing physicians may freely carry their medicines in pocket cases, saddle-bags, or in properly labeled original packages, across state lines or throughout territories or in the District of Columbia, and prescribe from them to their patients without labeling them as concerns their contents. They may also deliver prescriptions or mixtures to patients who must needs carry them across state lines, if the medicine be not sold as a drug. In other words, bedside and office practice not connected with the sale of medicine is not affected. But it must always be borne in mind that all medicines or prescriptions or mixtures if sold and shipped across the state line must comply with the law.

"Physicians are cautioned by Professor Lloyd not to purchase prohibited preparations that do not bear a label with the assay figures printed properly on the bottle, carton, or box. If in interstate practice, physicians should exercise care in regard to purchases; to keep volatile preparations well corked; be careful to dispense only to patients or for patients without making a charge for the medicine. If they sell medicines as drugs, or charge for a refilled prescription, they come under the law's restriction and must obey it or meet the penalties.

"Physicians can write legitimate prescriptions regardless, and mail the written prescriptions to be filled anywhere in the United States. This is not selling a drug.

"In addition to Professor Lloyd's suggestions, we may add that the preparations of all legitimate manufacturers will be found to be correctly labeled and bearing a guarantee to the effect that they comply with the law.

"Physicians therefore have only to demand for themselves, or for their patients, such preparations in original packages, bearing labels and guarantees showing that they comply with the Federal Act." — *Red Cross Notes.*

We are very glad to call to the attention of the readers of this JOURNAL the above extract.

Every word is valuable and should be carefully studied, especially by all those physicians who are in the habit of dispensing any medicines whatever.

It is much better to understand the law and abide by it, than to transgress through ignorance. This latter will not be accepted as an excuse. When a law has once been promulgated, it is the duty of those whom it affects to thoroughly understand its meaning and intent.

### PROFESSOR BOUCHARD'S OPINION ON PHYSIOTHERAPY.

TRANSLATED BY J. A. DENKINGER, M.D.

At the International Congress of Physiotherapy, held in Rome in October, 1907, Professor Bouchard, of Paris, expressed himself as follows, regarding physiotherapy:

"It would not be quite true to call physiotherapy a new science for the reason that the beneficial action of natural agents in the treatment of the ill, especially chronic cases, has long been recognized and utilized.

"But it is only during the last few years that, owing to the progress made in electricity, radiography, and hydrotherapy, these natural agents have been closely investigated and freely applied, with the result that they are now more generally recognized. In this sense physiotherapy is a new science.

"Its usefulness is certainly undisputable. The great advantage of physiotherapy over all other methods lies in the fact that it does not make use of drugs which, however excellent in themselves, have the general disadvantage of enfeebling some part of the organism, while strengthening another.

"True, physiotherapy is far from being a substitute for drugs, to which we must still have recourse in most cases. Physiotherapy has, however, been used with much benefit in cases of acute illness, as in cases of fever where hydrotherapy is used to great advantage in reducing the temperature in place of drugs.

"But the undisputed domain of physiotherapy is in the treatment of chronic diseases and the cure of delicate children.

"It is evidently more advantageous to get a chronic invalid or a feeble child in condition to battle against morbid tendencies by increasing the patient's power of resisting disease rather than by the use of such remedies as cod-liver oil, phosphates, etc. Here lies the great virtue of physiotherapy,—in the constant and scientific use of natural means which, instead of attacking the disease itself, act on the patients in such a way as to put them in a better condition of defense."

The above indicates, in some measure, Professor Bouchard's thought concerning the usefulness of physiotherapy in the treatment of abnormal conditions.

When we consider that the attendance at the Congress, where these thoughts were spoken, exceeded seventeen hundred, we must acknowledge that the interest in this method of treatment is gaining ground very rapidly.

### BOOK REVIEWS.

ALL books reviewed in this department will be sent, postpaid, upon the receipt of the quoted price. Send money order or bank check, making payable to Pitts Edwin Howes, treasurer.

*A Practical Treatise on the Diseases of Women*, illustrated by colored plates and numerous wood engravings. By John M. Scudder, M.D., late professor of the Theory and Practice of Medicine in the Eclectic Medical Institute, Cincinnati; author of the *Eclectic Practice of Medicine*, *Eclectic Materia Medica*, etc.; with a paper *On the Diseases of the Breasts*. By Robert S. Newton, M.D. Octavo, pp. 534. Cloth, \$2.75; sheep, \$3.50 net. Published by The Scudders Brothers Company, Cincinnati, Ohio.

This work is filled with information which cannot help but prove valuable to the searcher after truth, to the physician who desires, first of all, to restore patients to their normal condition as rapidly as possible.

*Clinical Treatises on the Symptomatology and Diagnosis of Disorders of Respiration and Circulation*. By Prof. Edmund von Neusser, M.D., professor of the Second Medical Clinic, Vienna; associate editor Nothnagel's *Practice of Medicine*. Authorized English translation. By Andrew MacFarlane, M.D., professor of Medical Jurisprudence and Physical Diagnosis, Albany Medical College; attending physician to St. Peter's and Child's Hospital and Albany Hospital for Incurables. Part I, "Dyspnoea and Cyanosis"; Part II, "Dyspnoea and Cyanosis in Disorders of the Circulation." 12mo, pp. 203. Cloth, \$1.50 net. Published by E. B. Treat & Co., New York.

This is the first of a series of monographs by this talented author on this subject which will be a great help in elucidating the diagnostic difficulties attending this class of affections. In the preface the following statement is made, which is a self-evident fact: "The diagnosis of disease must, in the great majority of patients, be determined at the bedside and not in the laboratory. Laboratory findings are most valuable aids to diagnosis, but are not, except in a few instances, diagnoses themselves, and never substitutes for clinical bedside work." In this volume dyspnoea and cyanosis are treated in a most comprehensive manner, and all the various conditions causing them are clearly set forth.

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## THE NEW YEAR.

THE JOURNAL OF THERAPEUTICS AND DIETETICS extends the compliments of the season and the wish that 1908 may be a bright and happy year for each one of its many readers.

In looking over the year just passed we feel that we have every reason to be gratified, *not satisfied*, at what we have accomplished. Our subscription list has steadily grown with each issue, and we trust the merit of each number has shown an increase in the minds of those who read its pages.

Not satisfied, however, we desire to still continue to enlarge the value of our JOURNAL to the busy, practical physician. As one means of accomplishing that end we have the pleasure of introducing, in this number, James Marshall French, M.D., as Associate Editor, who is already known in the medical world for his interest and knowledge in all that pertains to the usefulness of drugs in the restoration of the normal equilibrium. He has in view a series of articles, to be commenced in the near future, which cannot help being of much value to all those who are seeking after the best that lies locked up within some of the little used medicinal remedies.

Dr. French will write up some of the less favorably known drugs, and earnestly requests that every reader will send to the JOURNAL whatever experience they may have concerning the drug under discussion. At the expiration of six months these experiences will be incorporated in a new article, some of the facts having been published from month to month. It is earnestly hoped that every one will enter heartily into this plan for studying some of our neglected remedies.

In this connection we would again urge *all* of our readers to send us the little things of value that are constantly occurring in their practice, so that they may be published for the benefit of others. Remember, it is the *great duty of the medical men to give* of their knowledge, as well as to absorb what other physicians have found to be useful. Thus will they grow into large, complete, and well-rounded medical practitioners.

May we not also urge upon each one of our subscribers the good that will accrue, to all concerned, if they will speak of the JOURNAL OF THERAPEUTICS AND DIETETICS to their medical friends and urge them to join the family of subscribers? The larger that family becomes the better JOURNAL we can publish and the more extensive will be its influence:

It would be an easy matter for every subscriber to procure one other, and the aggregate would be very large. *Will you not do this at once?*

# DEPARTMENT OF THERAPEUTICS

## STROPHANTHUS.

BY SAMUEL B. PRATT, M.D., BOSTON, MASS.

**STROPHANTHUS HISPIDUS** is a rough, woody vine, the stem of which is often several inches thick. Its habitat is southeastern Africa and southern Asia. When found growing by itself, however, it usually takes the form of a bush, although in general it appears as a vine climbing even the highest trees, crossing from tree to tree, hanging in great festoons, or even lying in great coils upon the ground. Its physiological action as a poison is the result of the observation and warlike ingenuity of the African Kombe savages, who use it as a poison for their arrow heads.

The active principle of the plant is strophanthin, a glucoside which, being insoluble in either water, ether, or chloroform, should not, therefore, be prescribed in these menstrua, except perhaps at the moment of taking for it precipitates therein.

In toxic doses strophanthus acts apparently with violence upon all muscular structure. Yet it seems to the writer that this wholesale myological activity may be due largely to secondary and reflex pathological action rather than to the direct and unaided action of the drug alone.

Take, for instance, the medicinal action of strophanthus. Therapeutically it seems to act as an artificial stimulant, or a stimulating irritant, to the physiological activity of the unstriped rather than the striped heart muscle; at least, the writer gathers this last from other and more competent observers. The selective action, therefore, or the specific action of strophanthus, would seem to lie on or in this special tissue.

The drug is in no sense a direct nutrient, however, nor is it even a neutral drug in overdoses. On the contrary, slight overdoses show that its physiological stimulative properties can be easily turned into pathological irritation. It is, therefore, a therapeutic whip, a poison; and for this reason it acts, according to the writer's reasoning, primarily on the catabolic or excretory side of the metabolism of this special muscle. In other words, the catabolic side of the metabolism of the involuntary heart muscle seems to be possessed of that special chemistry that is capable of dealing with, or perhaps neutralizing, the otherwise toxic properties of strophanthus. And, in so acting, the catabolism of this muscle becomes artificially stimulated, or, in the case of toxic doses, irritated; the basis of the increased function of the muscle lying in the fact that reasonably increased catabolism, under reasonably normal conditions, also secondarily



stimulates the anabolic or nutritive side of its own metabolism, in order that the increased catabolism may be supplied and a complete metabolism result.

It must not be understood here, however, that an artificially stimulated metabolism of this character — or of any other character, for that matter — is the normal equivalent of that same tissue activity as it proceeds when wholly under the government of pure and unaided physiological chemistry. It is, however, often, and for a time, the artificial equivalent and it often proves, when directed by a specially trained and observant intelligence, the lesser of two evils in many pathological conditions. It often tides over critical periods for the patient, and sometimes for the physician as well when his searching, laboring observation utterly fails to grasp the complex problems antecedent to, for instance, this more manifest heart muscle weakness which he knows will become artificially strengthened for the time by the exhibition of *strophanthus*. And the point here is, that it could not become so strengthened and its function increased and followed by an equally prompt response in the contractile or systolic movement of the heart unless greater metabolic activity also occurred at the same time, just as it does elsewhere; for instance, on the exhibition of cathartics, artificial digestives, artificially digested foods, and probably all direct and artificial catabolic stimulants; all of which, sooner or later (generally sooner), cause the normal physiological catabolism (which is the stimulant, sensory side of metabolism) to grow lax and weak. For cells, except that the grade of their development is lower, are exactly like human beings, and learn all too easily to depend upon others, upon exterior aid, to do the work that they ought to do for themselves, — they quickly learn to degenerate, perhaps in sympathy with the overshadowing *ego* whose superior development and powers largely govern their destiny as integral portions of the organism. Between helping a person, or a cell, to help themselves, and helping them until they become weak, or even vicious, vampires, there is a tremendous difference.

A step beyond the medicinal action lies the effect of a mildly toxic dose of *strophanthus*. As the writer sees it, the stimulation of the medicinal dose is here increased by the mildly toxic dose to an irritation bordering upon pathology. The muscle fibers concerned begin to catabolize and excrete excessively. Their reserve of nutriment is so quickly drawn upon and catabolized that the anabolizing side of their physiological chemistry quickly finds itself unable to absorb and mature an equal amount of normally digested nutriment in time to supply the drain. As a result we would probably find either one of two secondary conditions appearing. That is, either other muscles, those of the nearest similar chemical grade to the unstriped heart muscle, would begin to absorb the

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excess of the drug, or else the heart muscle would take the whole burden and begin to work overtime, so to speak.

It is possible that both of these secondary results accrue from a mildly toxic dose, but, to the writer, it does not seem probable; or, if it is so, then it would still seem as if fully ninety-nine per cent of the work — whether it be appropriation or neutralization — would still continue to be done by this heart muscle. Because if the catabolism of the other muscles participated in a direct sense, and they began to appropriate that portion of the overdose that was proving too heavy for this heart muscle, then it would seem that they too ought to feel a stimulation that would fill portions of the body in which they were situated with a functioning sense of well being. Instead of this more general stimulative effect, however, we find, first, that arterial tension is tremendously increased by the now frantic activity of this particular heart muscle, and that this increase is largely mechanical. And while there follows a more or less general tonic effect upon the other muscles, and other tissues as well, it is no more, seemingly, than ought to result from the increased blood supply thus forced into them. That is, there seems to be no direct functional stimulation as is the case with the unstriated heart muscle. In fact, increase the overdose a little, and the functionality of these other muscles is lessened. Voluntary control of them is lost; they begin to stiffen; they lose reflex sensibility; become paralyzed; and this stiffness, when they die, passes directly into post-mortem rigidity with no line of demarcation; and yet all this time this heart muscle is functioning to the limit of its endurance. Even with mildly toxic doses of *strophanthus*, therefore, it would seem as if the involuntary heart muscle performed very nearly one hundred per cent of the chemical labor demanded by the presence of the drug within the body. To what, then, is this seemingly secondary result on the other muscles due?

In the case of a dose of sufficient size, and continued for a sufficient length of time, it would not take long for the artificial irritation to, for the time at least, more or less completely deplete the catabolic chemistry of this heart muscle. And in proportion as this was used up the muscle would also lose its chemico-psychic ability. That is, in proportion as this pathological condition increased — whether it took place as chemical change or a chemical depletion — in just that proportion would these muscle fibers lose their graded ability to respond either to the chemico-psychic impulses of the superior nerve forces, or to discharge their own grade of nerve force in response thereto.

For, to give a rough description of the process as the writer sees it, it is by aid of this depleting discharge of their own nerve forces that each fiber, acting as an individual, is enabled to pass on to its catabolic side that portion of its previously matured metabolism which is the chemical equiv-



alent of this discharge. Normally these discharges are induced by higher nerve forces — and so on we might follow up to the *ego*, which is the real controlling factor in a positive sense; the cells, together with the organism, etc., being the qualifying negative acquired growth upon and through which it is building a progressive tangible accumulation of its dynamic and refining growth. (Cells may die, and yet the body live on stronger than before. The body may die, but the greatest creative and governing forces of life are external to every one of the physical senses.) As these muscle fibers discharge their chemico-psychic force they also contract, the movement following in quick wavelike series throughout the bundles of fibers, and the whole combined forming one general muscle tension. It is also at or about this stage of its metabolic activity that the fiber cells release another and a more refined product of their own, the process undoubtedly being the analogue of intestinal nutrition. This product contributes toward the nutrition of still higher tissues. It is not a catabolic product. But to add a description of it (in theory) here would complicate in altogether too great a degree the one fundamental idea of the present effort. Suffice it, therefore, that it is the precipitate of this fiber cell metabolism that forms the true catabolic element; that the discharge of its own chemico-psychic force, which matured metabolism has generated, causes this internal chemical change and precipitation; and that, as a catabolic product, it becomes a sensory, negative, impelling (and of itself, destructive, annihilative) influence; which, under normal conditions, invigorates and excites the cell to absorb new nutriment because of the positive active compelling and constructive power that the next higher grade of nerve force (which ultimately is the dynamic grade called consciousness, or the *ego*) sends out, in correlated response, as a new impulse to fill the sensory impression that thus arises from the impelling influence of this catabolizing element and the slight stimulative tincture of a destructive annihilative void which is the reactive and qualifying function of its normal activity. And thus the circuit (both induced and direct) is completed, and the simple process continues. It is the law of all life, both visible and invisible, and from the highest to the lowest, differing only in the dynamic grades of its cumulative and accumulated energies, and the balanced or unbalanced condition of the two elements of which these energies are composed.

Thus, as an integral and normal portion of the body, these fibers can neither receive nor give a strong, well-balanced nerve impulse, nor even live as organic cells unless the chemistry of their metabolism, upon which these local chemico-psychic currents are based, is of the right physiological grade as well as quantity; and cells acting otherwise are but vampires, whether benign or malignant. Judging, therefore, by the effect of very sudden and extreme exertion, or prolonged corporeal punishment,

upon the body as a whole, it would not take long, under the artificial toxic irritation of strophanthus, for the catabolic side of this heart muscle to get beyond control, and to possibly become short-circuited within the spinal or sympathetic systems. And thus, in spite of its hardy character and ceaseless vigor, to become, between these two fires of strophanthus compulsion and an overinfluenced nerve impulse, catabolically exhausted before its anabolic side could mature enough of the new incoming nutriment to supply the deficiency.

This is practically a reversal of physiological processes. For, normally, metabolism is governed by the constructive psychic (which are here nerve) forces, which constructive ability it qualifies but does not govern. That is, the nerve forces are the positive commanding constructive element. They are as helpless, however, to express themselves without the accumulated chemical equivalent upon, or within, which to impress their unceasing creative dynamics as is their physiological chemical equivalent to retain its grade of human energy without constant absorption of these nerve forces. Excessive catabolism, therefore, but leads to degeneration — toward destruction and comparative annihilation. Thus, in the case of strophanthus poisoning, the chemical element, by attempting to take command, by overinfluencing, brings about an overdevelopment of its negative, destructive, painfully refining, and sensuous tendencies ; its function within its own grade being to react as it is acted upon, becomes incoherent, scatter-brained, and lacking in both concentration and sequence in proportion as its over-reactivity oversensuously over-influences the over-induction of an over-supply of nerve force such as the normal metabolism of that tissue cannot follow and mature with practical physiological results. In speaking of positive and negative, constructive and destructive, etc., it must be borne in mind that all grades of energy are simply more positive or more negative in their dynamic relations ; annihilation, for instance, being true merely in a comparative sense, and as impossible of utter and complete effect as is the action of nerve force without its reactive chemical equivalent. And right here comes the possibility that if anabolism could fully and normally keep pace with the terrific catabolic stimulation induced by strophanthus, or, possibly, if we could so command our nerve forces as to refuse the otherwise compulsory instigation of their aid, then the drug itself could not poison, but would, instead, soon become so adulterated by other elements as to be thus harmlessly thrown out of the system. This last is one of the suggestive points of the writer's theory, that poisoning by strophanthus is due to secondary causes.

This exhaustion of the catabolic side, together with the continued artificial irritation of strophanthus still toxically whipping it on to renewed exertion, would soon induce a condition in which the muscle would, to a

greater or less extent, lose all receptivity toward normal nerve and metabolic processes; and a continuance of this condition could result in but one general primary effect, that is, local degeneration. This degeneration might take the form of an acute neurasthenia or even a more deadly auto-toxemia within the muscle itself; it would depend upon the size of the dose, the length of time it had been administered, or the idiosyncrasy of the victim.

Let us look at it in the light of homely simile and thus incidentally save a few brain cells as well. We have all seen, for instance, the occasional unwise, weak-moraled mother working herself into mental and physical degeneration for a lazy, selfish, narrow-minded, and pride-ridden *ego*, who, for the sake of appearances, calls this weak-willed progenitress her mother instead of her slave. We have also seen the equally unwise man, with a heartless, shallow-brained, extravagant family. We have seen the quick-lunch fiend, the American business monomaniac, etc. In these cases we have a toxic normal drug, a drug that is possessed of as absolutely a chemical basis as is strophanthus. The only difference lies in the fact that the grade of its activities is upon a more intense plane of life action, for no form of psychic force can exist as an expression without the more negative chemical equivalent through which it may be qualified, individualized, set apart, surrounded by negative and annihilative principles, which thus give it tangibility or a specific existence in spite of all other existing things. In these cases, therefore, we have a toxic moral drug, projected by the mental or moral activities of these real slave-owners and becoming active on the catabolic side of some portion of the mental or moral activities of the recipient. In general the toxic result becomes a chronic pathology within the victim, a chronic catabolic mental pathology which can often be wholly summed up in the real meaning of the term "suggestion." For suggestion *per se* is a wholly negative quality, a catabolic stimulant or irritant and the basis of all the monstrosities that the world has ever known. It is the substitute for lack of directly applicable knowledge, a toxic moral drug. Theory, strictly based upon fact, in a stern yet humble search for other facts, is not suggestion. When we teach we do not suggest, or, if so, then we have failed, become short-circuited somewhere, and lost the progressive sequence of our effort. When we suggest, we may, if we are skilled, thus be able to tide over a temporary crisis, but we also run the risk of poisoning the victim. It is the chronic mental pathology induced by suggestion that is creating such a surprising increase of brain trouble at the period of this writing. Under the toxic influence of some suggestion the full life-expression of thousands of otherwise well-developed minds is becoming short-circuited and pathologically reactive upon little tangent side issues, thus checking the onward growth of the mass of their higher forces which are increasing so abnor-

mally in this over-strenuous age. Could they check this superior growth altogether and simply live below the plane of this partial short circuit there would be less suffering. But as it is, these higher forces, unable to continue with their normal dynamic freedom, accumulate like the steam in an engine whose throttle has been shut off without decreasing the fire — something is quite likely to burst. And not only are pathological physical conditions thus also, sooner or later, quite likely to be correlated within their organic chemistry, but ordinary bodily ailments may also thus be led to affect the weakened brain and nerve tissue.

The emotional, intellectual, and moral grades of life expression are, although far more powerful and active, more subject to our desire in proportion as we are conscious (a positive force) of that desire than are the moral material grades. The victim of a moral toxin soon degenerates, temporarily, nearer and nearer to a level of this excessive catabolic action. For, true to its negative, reactive, destructive, annihilative characteristic, it grows more and more irritative as it keeps on refining itself toward the little end of nothing, and yet never ceases. Once upon this tangent, therefore, there will come some stage in the process when the victim gets so far out of harmony, out of reach of this stage of life, that all tangible connection is lost; thus they may die, go to an asylum, or perhaps kill themselves. And the position of this strophanthus-goaded muscle is much the same. Most, if not all, of the other muscles throw the labor of neutralizing the drug upon this one muscle, whose metabolic activities seem fitted to deal with it. Exactly like an overactive or overprolonged suggestion, however (for thoughts, on their own grade of activity, are things), this victim-muscle succumbs. The other muscles, as the writer sees it, lie back and take their ease, for the slave is working, working overtime for them, and they swell out proudly as the extra supply of blood and nutriment reaches them. Soon, however, the cells of this overworked muscle and its propinquitous tissue lose their fullness. They take on a haggard, indented appearance. Physiological stimulation has turned into pathological irritation. The chemical basis of its normal catabolism begins to change and with this change goes normal appetite also. Still artificially goaded on by the strophanthus, some sort of a chemical basis for the now frantic catabolism must be supplied; and, to use the simile, it becomes a quick-lunch fiend, for there is no time to select, digest, and mature the nutrition that lies so plenteously around. Something they must have, however, anything, to fill the increasing void.

Its artificially irritated appetite (a condition not unlike that induced by the "bracer" before the quick lunch) feverishly snatches at anything short of absolute refuse that will require the least digestive force, particularly anything that will temporarily and most quickly satisfy. Then comes an acute dyspepsia, so to speak, followed perhaps by an extreme

constipation. An acute diarrhea quickly supervenes and the stuff that it has gulped down begins to pass through largely undigested. A serous diarrhea follows, the good serum from their secretory, anabolic side beginning to pour out on the catabolic side, the excretory mucus perhaps even ceasing to be formed. Still the drug whips on the catabolic remnant. The blood and lymph channels round about begin to fill with this half-digested refuse, which, being neither food nor excrement nor even vomit, so to speak, becomes a peculiarly insidious poison, an autotoxin, a muscle poison.

It is the insidious character of this toxin that must be borne in mind. It is not in a condition, chemically, to pass out of the body. Its chemistry is not that of a true catabolic product. It is neither one thing nor the other. Normally all catabolic excretions are pure and absolutely necessary stimulants to the physiological chemistry, and without them life could not exist. But when they become abnormal or subnormal it is then that we find ourselves open to pathological experiences. For all normal catabolism has its various special channels toward complete elimination from the body. It is not within the province of nature to waste an atom or a motion. Normally these excretory products are completely and perfectly utilized, step by step, as they earn their way outward by, so to speak, the sweat of their brow. The digestive fluids, for instance, are nothing but excretory products from higher tissue grades in the body, earning their way outward by useful practical labor, and governed and led or introduced to this new labor by the catalyzing agents which stand between the different grades of tissue activity for this special purpose. The normal catabolic excretion of the unstriped heart muscle, therefore, has its special road, its special labor, even after it has been excreted from the muscle itself. But when it is of a degenerated or immature character it cannot do this farewell work as it should. In fact, and as a result of mild *strophanthus* poisoning, it becomes not only immaturely incapable, but a powerful irritant, and as an irritant it finds the outward osmotic chemically-qualified and nerve-governed channels of its otherwise rightful passage closed, whereas its chemical activities, if they were normal, would otherwise have been of a grade to usefully join with other chemical activities to help them on their way into the body, as it itself passed out; and in so doing it would also help to add to the chemical psychics (or physical nerve force) of these portions of the body that intangible and positive element of constructive force which all chemical activity liberates and without which all things would be absolutely negative.

Moreover, this immatured catabolic product is still perhaps half a food as well as half or perhaps wholly a toxin. Again, it is a muscle toxin. That is, its chemistry, as far as the body is concerned, is in a half-way, unfinished condition. It, therefore, still has more or less affiliation

toward myological chemistry, and probably no affiliation whatever, by comparison, toward any other class of tissue; nor is it sufficiently developed as a catabolic product to pass out of the body. Is it not this peculiarly insidious muscle toxin, therefore, that, acting as a secondary product, thus causes all the other toxic muscle symptoms? And herein lies the point of this paper thus far.

Further, aconite and veratrum are the chief antidotes to strophanthus poisoning, and both of these drugs are capillary dilators: aconite in the so-called asthenic conditions, and veratrum in the sthenic. They are not capillary dilators, however, in the sense, or in the manner, that glonoin is, but seemingly act best in autotoxemic conditions under the irritation of which these delicate microscopic little tubes become inflamed, or swollen, or constrictively irritated, because of the chemical quality of the irritant that is circulating either on the blood or lymph side of their delicate membranes. Conditions of this character are largely due to immature nitrogenous metabolism, to which class the involuntary heart muscle would seemingly belong.

Analogous conditions of a slightly different chemical character would also seem to base the so-called cumulative effect of digitalis, the chemical resultant being different because digitalis increases the catabolism of a different class of tissue. Many of us have had one or more startling experiences in this line; and others, with eyes that could not see, have let the experience pass on to the undertaker. There is no telling when or in whom this so-called cumulative result will appear, so peculiarly insidious and sudden is its appearance. To the writer, digitalis would seem to increase the catabolism of some tissue, an increase in the metabolism of which also increases the nutrition of the vasomotor and perhaps similar muscle fibers. It certainly causes the arterial capillaries, although fiberless, to become more elastic; and this fact, together with the increased time necessary before the full effect of digitalis (as compared with strophanthus) appears, would seem to indicate that the tonic effect upon the fibers is indirect. However, this is not so much the point as is the fact that, after the first few hours, a continuance of the exhibition of digitalis tends to retain urea in the body. Somewhere, therefore, on the excretory path taken by urea, digitalis catabolically interferes with metabolism, and this interference need not be altogether wholly or even partly in the kidneys. And does it not seem far more reasonable to hold the chemical result of this suddenly appearing defective metabolism — the retained urea, or some of its by-products, etc. — as the real cause of the so-called cumulative effect of digitalis? In fact, do not all poisons act in a similar manner? Excessive use of stimulants by over strenuously increasing catabolism and thus changing its chemical qualities somewhat as described, and the over-use of narcotics also by degenerating catabolic resultants to a



condition where a lowered (indolent, supine) product that is largely unfitted for the grade of physiological duties intrusted to it, is tolerated because the lowered chemico-psychic equivalent (nerve force) has proportionately lowered the sensory side and thus numbed the irritative warning that the toxic catabolic product would otherwise have given. In fact, this warning is given with a vengeance when those addicted to drug habits endeavor to stop using the drug.

By increased systole, *strophanthus* mechanically increases arterial tension. That is, it has little or no effect upon the vaso-constrictors; unless perhaps it may be an effect similar to the secondary effect of, for instance, food in the stomach or esophagus, — a sympathetic reflex mechanical effect, wherein the mechanical increase of arterial tension of itself sympathetically arouses the vasomotors. The primary action of *strophanthus*, therefore, is not always accompanied by an equivalent amount of propelling force, such as the wave-like motion of the arterial muscles gives.

For it seems the height of folly to suppose that, reasoning upon either mechanical or hydrostatic basis, the heart of itself has power to more than keep the larger arteries and arterioles fairly supplied; doing this even under a constantly decreasing distal pressure, for it must be borne in mind that this pressure is being applied to a quickly moving viscid current and not to a slowly active liquid of light density within the confining walls of which the pumping force of the heart could accumulate pressure with little friction. *Strophanthus* would be a less dangerous drug medicinally at times if the heart alone kept up the pressure. If the blood vessels were tubes of a stated diameter, the heart might then more easily accomplish its work alone, but it has to pump against tubes whose tendency is to narrow on the least provocation. The semi-liquid forced along is, moreover, filled with white cells, and non-motile and larger red cells. Further, these white cells are constantly stopping here and there to absorb nutriment and fastening themselves to the walls of the blood vessels; thus, by countless millions, still further tending to check the flow of the heavy yet rushing current. This current traverses not only arteries and practically inert veins, but also millions of microscopic capillaries, wherein the red cells especially often have to be pressed from their discoid form in order to be crowded through, and the force that thus crowds them and rushes them onward in spite of this dragging, compressing, and direct frictional resistance must be, all told, tremendous, and far in excess of the mechanical ability of the heart. The principle upon which semen is ejected, or some modification thereof, is, to the writer, exactly the basis of the systole and arterial activities; the activity of the capillaries being supplemented by osmotic and direct chemical action. Even the clitoris of the female, in orgasm, has the same wave-

like contraction, which forces arterial blood into it until it seems as if it were having a series of blood-red apoplectic fits as it shoots out tense, enlarged, and highly colored. This sudden and comparatively tremendous influx of blood into the little organ is not due to a pathological condition, nor is it due to any direct action of the heart. No unaided venous mechanism could bring it about, nor could any unaided capillary activity. It is, judging by the two or three accidents of this character which have passed under the writer's observation almost before he knew what was taking place, too sudden, in spite of the previous erect condition of the organ and the amount of blood forced in, too great, to be explained otherwise than by the arterial propulsive force. Again, the arteries are cone-shaped.

When, therefore, the increased systole produced by strophanthus is not supplemented by a sufficient degree of arterial propulsion, the effect is equivalent to a mechanically obstructed circulation, and strophanthus is apt to prove a dangerous drug in this class of obstruction. The arteries have one-tenth less resisting power than the heart, and this resistance is lessened when the vaso-motors are weak. Like any other muscular tissue, they can stand a much heavier strain if it is but momentary, with an interval of more or less rest and recuperation in between, as is the case with the normal vaso-motor impulse. But when this impulse is weakened, and these fibers more or less inactive, the steady strain of an increased systole on the slowly moving arterial current is of just that tonic quality that they are not fitted to bear, even though the sum total of the pressure itself be considerably less than with a normal heart and arterial action. And thus in some cases of edema, atheroma, sclerosis, etc., an injudicious use of strophanthus may easily increase the trouble, although apparently at the time it relieves it. There are some also who respond to medicinal doses of the drug with exaggerated contractions of the heart.

The writer remembers one case, subject, among other ailments, to edema of the glottis at times. The primary condition, however, may have been temporary internal enlargement of the thyroid, and the edema secondary to it. At any rate, it interfered seriously with her breathing when it did occur. The whole condition was secondary to an inherited neurosis. Health had been fairly restored, however, and the edema had not appeared for months until one day, to save work, strophanthin was given, the dose being but 3-134 gr. for the week. Before the end of the week the edema appeared again, but disappeared with the cessation of the drug. To be sure of the fact the experiment was repeated, with the same result. There has been no recurrence of the trouble, however, and no strophanthin prescribed in the year or more intervening.

In another case of general prostration from excessive mental work as a stenographer, a lady, thirty years old, came back to the writer with

edematous feet and ankles as a result of the exhibition of strophanthin. The trouble was one that she had had ten years previously, but it ceased with the cessation of the drug.

Another, a woman with tabetic history, strong and healthy to outward appearance, about forty-two, of active, steady, composed purpose, one of the world's helpers and not a neurasthenic, did excellently for over a year under treatment, although she had been a steady but uncomplaining sufferer for some years before this. Upon the basis of these favorable conditions the writer's consent was gained, and, stocked up with medicine, the patient undertook a long journey. The only dangerous drugs given were digitalis and strophanthus. These drugs had been used in her case in not over a dozen doses all told, and then only to help clinch the certain pathological crises that, in the beginning of treatment, the milder remedies had temporarily been unable to cope with. These conditions were sudden dizziness, difficult breathing, weak systole, a tendency to fall backward, instant loss of voluntary motion, but without falling, blindness, a sinking sensation, etc.; and this would either be preceded or followed at some time during that twenty-four hours by a tremendous belching of wind at a time when the stomach was most empty — a condition common to many tabetics, and with many cases of cervical degeneration. No other circulatory stimulants acted as well as did these two, and adrenaldin. Digitalis, however, was far too slow, even with the aid of adrenaldin. When several thousand miles away she met with several minor accidents, one right after the other, and, together with the strain of the journey, the whole resulted in a return of her old "spells." Little wonder then that she resorted to strophanthus, in spite of the writer's warnings — resorted to it until even the adrenaldin lost its effect. And she returned only to die a few days later.

It must be remembered that she was distinctly tabetic, with a specific family history, loss of pupillary reflex, etc.

Before coming to the writer she "walked upon cushions" and suffered the various neuritic pains in all her limbs, etc. There was a secondary growth in the region of the liver, but up to the time of her journey the waist line at this point had been reduced by several inches. On her return this had again enlarged, the straight lines giving it the appearance of a man's waist; and autopsy showed it to be a sarcoma of the gall duct. Among other conditions autopsy also showed a complete bone-like transformation of the right suprarenal capsule — it popped out like a marble. The left suprarenal was also somewhat affected — she had been subject, by the way, for years to bronze-colored patches at the waist line. There was also complete occlusion of the inferior vena cava by a fibroid growth springing from the interior, and undoubtedly similar growths in other vessels, and a great thickening of their walls in places. And yet the heart was found to be absolutely normal.

We have here a whole series of mechanical obstructions, both to the vaso-motor circulation and the nerves. Even the stimulation of suprarenal activity upon the peripheral capillaries was largely lacking, and yet the heart was strong. Is it any wonder then that strophanthus, acting through a strong heart, and, in spite of mechanical obstructions, increasing arterial pressure sufficiently to tide over a temporary crisis, should, by this mechanical increase of pressure, unduly force the blood into the thin-walled, diseased blood vessels of the sarcomatous region? The mechanical strain undoubtedly helped to increase the vascular fibroid growths also, thus increasing the trouble; but it was the sudden and acute spread of the malignant growth under this pressure that was the immediate cause of her death.

Where, therefore, there are mechanical obstructions to the circulation, or with some forms of edema, atheroma, sclerosis, or great relaxation of vessel walls, or in hyperemic cases with tendency to hemorrhage, strophanthus can often more easily increase the pathology than remedy it, unless carefully exhibited and perhaps supplemented by other measures. Diuresis would seem to be one indication of its good action, and sometimes this diuresis continues long after the drug has ceased to be exhibited, thus showing, perhaps, that it has tided the body over a temporary emergency. Where diuresis does not take place, nausea and gastric and intestinal disturbances are more likely to take place, although the liability is not so great as with digitalis. In medicinal doses strophanthus does not noticeably affect the vaso-constrictors, and, therefore, it does not interfere with the nutrition of the heart or coronaries; in fact, the increased arterial pressure induced by it will often, when indicated, increase the nutrition of the heart.

The writer uses little direct circulatory stimulation in his practice, finding that he can generally induce much more permanent results in other ways, and by the use of a few more brain cells. Still, a clientele of the neurotic, neuritic, neurasthenic, the nerve degenerations in general, old age, and the chronics of complicated Chinese-puzzle-like pathology, require different handling from the ordinary clientele; and more wholesome indications are undoubtedly found for direct heart remedies in a general practice that is made up largely of acute cases. And where merely the systole needs to be strengthened, and especially in mitral diseases, or regurgitation, particularly if the urine is small in quantity and dark colored, with a dropsical tendency, strophanthus will often show striking results if there is a weak or weakened heart muscle behind the difficulty, and if its exhibition is followed by diuresis. Diuresis here is probably one indication that the catabolizing channels lying between it and the catabolism of the involuntary heart muscle are fairly normal.

To recapitulate, strophanthus acts probably by direct irritation of

the fibers of the unstriped heart muscle — and perhaps it irritates other unstriped muscle as well — but it does not seemingly act through the nerve centers. In death from strophanthus poisoning the heart is checked in full systole. It increases the contractile force of the heart, but not to any degree that of the arteries. In emergency it acts more promptly than digitalis, but its effect is more ephemeral, and the dose has to be repeated every three to five hours for sustained effect. Small doses render the heart stronger and the pulse less frequent, toxic doses mechanically increase arterial tension enormously. It is not so apt to irritate the stomach or intestines as is digitalis.

It is generally contraindicated in mechanical obstructions to the circulation, also in hyperemia, with tendency to hemorrhage. Very long-continued use of the drug may induce atheroma. It should not be prescribed in water, ether, or chloroform, except at the moment of taking, as it precipitates in these menstrua.

It is of value in:

Mitral disease, with little urine, with regurgitation, or with great anasarca, giving striking results usually when the heart muscle is weak.

May be given where you have a rapid heart, from muscular weakness, inactivity, or lack of contractile force, and it also acts well in these conditions with children and in senility. If there is also congestion of the kidneys or lungs, the beneficial effect of strophanthus is generally prompt.

Dyspnea is often relieved by it in a few minutes, and sometimes the effect lasts for weeks without further dosage. And it is generally prompt in relieving acute heart failure with dyspnea.

Disturbed compensation, aortic disease, arteriosclerosis, atheroma, and fatty heart will often be benefited by the drug if rightly used, as will also the reflex palpitation of neurasthenia, hysteria, and chlorosis.

Diuresis, if observed, is apt to be quite permanent, general edema often disappearing with the beginning of the diuresis.

It is of value, therefore, in ascites of liver, cirrhosis, uremia, uremic dyspnea, chronic Bright's disease, nephrolithiasis, etc.

Urticaria has been reported cured by full doses.

Exophthalmic goiter has been markedly improved by, say, 4 to 10 drop doses of the tincture four times a day.

Asthma paroxysms have been both aborted and prevented, especially if diuresis occurs. And the same report has been made even of tetanus and cholera.

Anemia, of the persistent chronic variety, or from acute flooding, is sometimes greatly benefited if a weak heart muscle is back of the difficulty, and especially if diuresis supervenes.

In empyema and autotoxemias strophanthus is often of great assistance. And it also helps in the appropriation of iron, where the latter causes palpitation, insomnia, etc.

**CHIONANTHUS VIRGINICUS.**

BY J. M. FRENCH, M.D., MILFORD, MASS.

SINCE the days of Prof. I. J. M. Goss, of Georgia, *chionanthus* is the first thought of the eclectic physician in cases of jaundice. Goss tested the remedy on himself when suffering from an attack of jaundice, as early as 1843, and reported that he considered it the best remedy for all cases of jaundice not dependent on gallstones. Professor Scudder went farther than this, and lauded it especially in those cases in which calculi were present.

*Chionanthus virginicus*, commonly known as fringe-tree, old man's beard, snowdrop tree, and white ash, is a shrub or low tree belonging to the natural order Oleaceæ, growing in the southeastern parts of the United States, from Pennsylvania to Georgia and Tennessee, and reaching a height of from 6 to 25 feet. It abounds in sandy soils, in elevated places, near flat rocks, and along river banks, and blossoms in May and June. The part used in medicine is the bark of the root. It contains two active constituents, saponin and chionanthin, neither one of which fully represents the medicinal activity of the plant.

According to the old terminology, the properties of *chionanthus* are given as alterative, aperient, diuretic, tonic, febrifuge, purgative, cholagogue, and acronarcotic. A more modern statement of its actions and uses is as follows: its principal sphere of action is found in the glandular organs of the abdominal cavity. The nature of its action is shown in relieving congestion and promoting normal circulation. Its most important use is in relieving sluggish circulation of the liver, together with the long train of symptoms resulting therefrom, either directly or indirectly.

Scudder recommends *chionanthus* in the treatment of biliary calculi. According to this high authority, there are two direct indications for its use: The first is jaundice, as shown by yellowness of the skin and conjunctiva. The second is hepatic colic, with soreness and pain. The latter is by far the most direct indication.

Ellingwood states that the specific influence of this agent is exerted on the liver. It is the remedy for engorgement of the liver and jaundice. It overcomes catarrh, liquefies the bile, prevents the formation of calculi and promotes the discharge of those formed.

While these are the primary and most important uses of this drug, "it has been used with good results" in many other conditions, such as fevers, gastric and intestinal dyspepsias, diarrheas, rheumatic conditions, inflammations of the spleen, kidneys, pancreas, and other glands. It is of utility in uterine and ovarian congestions, when the usual hepatic conditions are present. The list of diseases in which it has been used with

benefit is a long one, but they may mostly be included under two heads: (1) Those in which there is a complication or condition dependent upon one or the other of the two conditions named by Professor Scudder, and in these cases the real indication goes back to the relief of congestion of the portal circulation. (2) Those for which there are many better remedies known, and for which it is not worth while to make use of chionanthus, while so many better drugs are at hand. The chief aim of eclectic medicine, as I understand it, is to provide, not remedies which may be used in many conditions as a makeshift, but those which are of special value in certain definite conditions, in which they are plainly the best.

The dose of the powdered bark is 30 to 60 gr.; of specific chionanthus, which is the best preparation for most purposes, 10 drops in water every three hours is the usual dose. The concentration, chionanthin, is used in doses varying from  $\frac{1}{4}$  to 5 gr., according to the effect desired. The standard granule of the alkaloidists is  $\frac{1}{8}$  gr. and of these the dose is from 3 to 6 after meals and at bedtime, as a general eliminant, hepatic stimulant, and cholagogue.

Blair ("Materia Medica and Therapeutics") speaks of its uses in different doses as follows:

*In large doses* (20 minims of specific chionanthus for four doses, and then 10 minims at a dose if necessary to continue,— frequency of dose not stated), it is a mild cholagogue cathartic.

*In moderate doses* (5 to 10 minims) it liquefies the bile, prevents the formation of calculi, and is probably one of the very best remedies for jaundice not due to occlusion of the duct or to malignant growths. It is very sure in its action in the jaundice of gestation. Its action in chronic liver disease is most happy.

*In small doses* (1 to 3 minims) it is combined with iris versicolor, and alternated with sodium phosphate, if necessary, in the treatment of sick headache, bilious headache, and those due to menstruation. It is quite effective in this connection.

The chief synergists in diseases of the liver are leptandra, podophyllum, and iris. In derangements of the female pelvic organs, it is synergistic with gelsemium, macrotys, and pulsatilla.

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"SAY not 'a small event!' Why 'small' ?  
 Costs it more pain than this, ye call  
 A 'great event,' should come to pass  
 Than that? Untwine me from the mass  
 Of deeds which make up life, one deed  
 Power shall fall short in or exceed!"

— Robert Browning.

## TREATMENT OF PNEUMONIA.

BY WILLIAM H. RUSSELL, M.D., IPSWICH, MASS.

WE are approaching the pneumonia season and now is the time to consider the therapeutics of the pneumonia patient; how shall we treat such a patient?

The treatment of a person suffering from pneumonia depends upon three conditions,—septicemia, dilatation of the right side of the heart, and the mechanical interference with respiration, which includes the condition of both heart and lungs.

There are two types of pneumonia patients, the sthenic and the asthenic; therefore it is unnecessary to say that our treatment must be directed toward relieving the patient of the pathologic conditions which he may present from time to time during his sickness. The name of the disease should not in the least influence the therapeutics directed to its cure.

Some pneumonia patients resemble very much some diphtheria patients,—the sudden invasion, the profound systemic poisoning, and degeneration of heart muscle,—but the serum treatment has not proved so beneficial in the treatment of pneumonia.

The condition of the pneumonia patient suggests the treatment. The congestion which precedes pneumonia was formerly called the first stage of pneumonia. To-day the patient is not supposed to have pneumonia until the stage of consolidation has supervened. If the physician cures the congestion, he prevents pneumonia, but does not cure that relic of nosology which was so nicely systematized by Dr. John Mason Goode. The treatment should be directed towards conserving the vital forces of the patient, elimination of toxins, supporting and strengthening the dilated and weakened heart muscles, strengthening the muscles of respiration, and relieving the severe shock to the nerve centers.

Every pneumonia patient requires treatment adapted to the condition which he presents as the physician makes his visits from day to day.

If the patient has passed the stage of congestion and the lung is solidified, it should be the endeavor of the physician to conserve and sustain the vital power of the patient.

It is probable that almost every drug in the Pharmacopeia has been used, at some time, in the treatment of pneumonia, until, at the present time, the dominant school has veered to the other extreme and now declares that drugs have a very small place in the treatment of this disease.

We believe that drugs accomplish as much to-day as they were *believed* to accomplish fifty years ago.



Twenty years ago the patient sick with pneumonia was given whiskey in very large doses. Alcoholic stimulation was considered the *sine qua non* in the treatment. A few years later the patient was treated with large doses of strychnine. Carbonate and iodide of ammonia were also considered indispensable in the treatment. After this, iodide of potassium, carbonate of creasote, and intestinal antiseptics came into vogue. After the discovery of the "germ," which was supposed to cause pneumonia, the authorities lost faith in the old methods of treatment, and declared that all diseases caused by bacterial infection were "self-limited," and that treatment could not influence the cause of the disease at all.

Thus has the theory of the cause and treatment of pneumonia changed almost as often as the style of female wearing apparel. Treatment with the dominant school seems to be largely a matter of fashion — a fad.

The eclectic and homeopathic schools of medicine have made a special study of drug action and have successfully treated hundreds of cases of pneumonia; or it would be more correct to say have successfully treated patients afflicted with conditions to which the name pneumonia has been applied. Remedies which were successfully used thirty years ago are used to-day to remove certain diseased conditions, no matter whether these conditions be observed in pneumonia patients or in those afflicted with a certain chain of symptoms to which some other name may be applied. With them remedies are prescribed in accordance with certain fixed laws, and, like the laws of the Medes and the Persians, they can suffer no change.

The mistake which is usually made by physicians not acquainted with the laws of specific diagnosis and specific medication, when giving remedies in the small dose, is to prescribe for the name of the disease instead of for the condition of the patient.

There is now a great desire on the part of physicians educated in other schools to learn the methods of the eclectics in the application of remedies for the cure of disease. We would say to these physicians, first, learn the law as laid down in Scudder's "Specific Diagnosis," and "Specific Medication." You will then have a foundation upon which to build your superstructure.

We will give a few illustrations of the treatment of the pneumonia patient.

**INDICATIONS.** Give remedies which will control the frequency of the pulse, give a regular and uniform circulation, and increase secretion both of the skin and kidneys.

*Veratrum viride* should be given when the pulse is full and either hard or bounding, *i. e.*, an active circulation, a sthenic case in the congestive stage of inflammation. A prominent keynote for *veratrum viride* is

a dry tongue with a red streak drawn through the center. *Veratrum viride* in proper dosage — 10 to 20 gtts. of the specific medicine in  $\frac{3}{4}$ iv of water,  $\frac{3}{4}$ j hourly — is a heart tonic, the typical *veratrum viride* indication being present.

It must be obvious to the thinking physician that we are not prescribing at the tongue, but that the condition of the tongue is the manifestation of a certain pathologic condition which *veratrum viride* will remove. Also that *veratrum viride* will remove this pathologic condition whatever may be the name applied to the collection of symptoms or conditions with which the patient may be affected. If the tongue, circulation and mental symptoms indicate *veratrum viride*, that is the remedy regardless of the name applied to the disease.

Each and every remedy must be studied and the condition of the patient determined at each visit of the physician. There is no remedy or collection of remedies "good for pneumonia." All remedies named in this article are indicated in certain conditions which supervene in pneumonia patients. They must be administered, however, in accordance with a definite law of therapeutics. If the patient presents symptoms of toxemia or septicemia the treatment is obvious.

Remedies act in a mechanical and a dynamical manner in accordance with the size of the dose and the effect desired by the prescriber.

The physician who prescribes his remedies in accordance with a definite rule of action will find a vast field opened up to him for investigation.

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"THE true way to gain influence over our fellow-men is to have charity toward them. The spirit of wisdom is the spirit of love." — *Charles Kingsley*.

"LET us for our lives do the work of men while we bear the form of them. . . . 'The work of men.' And what is that? We may any of us know very quickly on the condition of being ready to do it." — *John Ruskin*.

"'BLESSED is he that feedeth the poor,' but 'Blessed is he that considereth the poor.' And you know that a little thought and a little kindness are often worth more than a great deal of money. This charity of thought is not merely to be exercised toward the poor, it is to be exercised toward all men." — *John Ruskin*.

"LET men see that you are real, — inconsistent, it may be, — sinful, oh! full of sin, impetuous, hasty, perhaps stern. But compel them to feel that you are in earnest. This is the secret of influence." — *Frederick W. Robinson*.

## THERAPEUTIC NUGGETS.

**THE COMPOUND TINCTURE OF LOBELIA AND CAPSICUM**, made by macerating 3ij a.a. lobelia, capsicum, and symlocarpus foetidus in 3ij of dilute alcohol and percolating, makes an excellent cough remedy. Be careful that your dosage is not large enough to produce nausea. One or two drops on a little sugar, frequently repeated, will help to get rid of many irritable coughs.

**ASCLEPIAS TUBEROSA**. This drug acts specifically upon pleuritic pains, especially if they are of a sharp and cutting nature. It may be given in 15 gtt. doses every two or three hours. When given in a hot infusion asclepias will act as a powerful diaphoretic, and is valuable in the early stage of all fevers.

**EUPHRASIA OFFICINALIS**. This agent exerts a special influence upon catarrhal affections of the nasal cavity. In acute coryza give 10 gtt. doses every hour. Where the snuffles, so called, trouble young infants, add 5 gtt. to 3iij of aqua and give in 3i doses every ten to thirty minutes until relieved. Many times this agent will find a place in the treatment of measles to relieve the coryza that is so troublesome in the early stage.

**JUGLANS CINEREA**. Juglans will be helpful in cases of skin disease which are found to be due to wrongs of the digestive apparatus and poor assimilation. To produce its best results it must be used both internally and externally at the same time.

**EUONYMUS ATROPURPUREUS** is a good tonic to the liver where a strong action is required. It acts as a stimulant to this viscus, improves its blood-making powers, and increases the amount of bile. Dose: Extract, j to iiij grs.; spec. euonymus, 5 to 30 gtt.; Fl. ext., 3j to iiij.

**SPEC. BRYONIA**. Indications, neuralgic pains in right side of the head from eye to occiput, pain of tensive character, tensive darting pain in joints. Dose: 10 gtt. to 3iv aqua; mix; 3j every one or two hours. *Niederkorn*.

**COLOCYNTH IN ABDOMINAL PAIN**. Where these pains are of a sharp and cutting character, are increased by tenesmus, and gas passes at stool, this drug will give relief. Add 1 to 2 gtt. of spec. colocynth to 3iv aqua and give in 3j doses every half hour till free from pain.

**TRIFOLIUM IN COUGHS**. In all spasmodic coughs, such as those produced by measles, whooping-cough, and an irritable condition of the larynx, trifolium will give good results. Five to ten drops of the specific medicine may be given every two or three hours.

**PHYSICAL THERAPY.****DRUG THERAPY AND ITS RELATIONS TO ELECTRICITY.**

BY PITTS EDWIN HOWES, M.D., BOSTON, MASS.

To a certain extent the subject which I am to present this evening may seem rather incongruous, and yet upon closer investigation the two portions of it will be found to be closely related.

For a short time, then, let us consider "Drug Therapy and Its Relations to Electricity."

That we may approach the subject from a correct standpoint, it will be necessary to ask and answer a few pertinent questions:

*First.* What do we mean by the term physician?

*Second.* What is generally understood to be his duty to those by whom he is employed?

*Third.* What should be his method of acquitting himself of these self-imposed tasks?

The word physician may be defined as a person who, by the proper study of the different parts of the human body and their various functions, together with a comprehensive knowledge of what will restore their normal action when disarranged, is fitted to undertake the cure or relief of what is popularly known as disease.

His duty, from the viewpoint of those who seek his services, is to use such means and appliances as will, in the shortest space of time, restore them to their normal condition.

Beyond question, if the physician is to live up to the full requirements of his position, he must make himself familiar with all means and methods which will aid in the accomplishment of his desires.

Thus we see that the medical practitioner has before him a problem of ever-widening circumference. It cannot be limited or circumscribed.

The old method of regarding disease as an entity, classifying a group of symptoms under a given name, and then prescribing *at that name*, has been of great detriment to the scientific advancement of the practice of medicine.

Much of the therapeutic nihilism of the day has been and is due to this wrong conception. Too much was required of the drugs. Too much was required of the other modalities.

A great stride would be taken if the term disease could be stricken out of our medical vocabulary. All conditions can be classified under three heads, — *normal, above normal, subnormal.*

When patients present themselves, the first step is to decide in which of the two last they are to be placed. The correct determination of this is the key to the necessary treatment.

Again, among the various wrongs that are manifesting themselves, there is always one which is more prominent than the others. The righting of this is the first study. Frequently, the correction of this departure will be followed by the subsidence of all the others.

The idea of classifying the ailments of patients under distinct names for the purpose of treatment is being abandoned by the most progressive of those who, heretofore, have maintained their entity.

There were several at the last meeting of the American Electro-Therapeutic Association, held in this city, who insisted that it was necessary to determine the exact condition of the patient, and then fit the modality and its method of use to that condition. This is a step in the right direction and cannot fail of being productive of good.

There are many physicians who are studying drugs along these same lines and are developing knowledge that is both accurate and useful.

Doubtless, there is no one here this evening who would have the temerity to maintain that electricity, with its various modalities, is able to restore all persons to their normal condition. On the other hand, I do not think that the most firm advocate of drug therapy would attempt to argue that *nothing* except drugs is needed for the restoration of those who are out of tune.

The members of this and kindred organizations are doing the medical profession a vast service in studying and recording the influence of the various electrical appliances upon the wrong conditions of the human economy.

In like manner many physicians are studying and demonstrating the action of various drugs upon the different manifestations of abnormal and subnormal wrong.

It is a truism that *like causes will produce like results*. This is accepted by scientists in all realms of research. If this can be demonstrated in the practice of medicine, then it must be admitted that medicine is to that extent being placed upon a scientific basis.

That this has been and is being done by many progressive practitioners of medicine must be admitted by those who are the most familiar with their work.

Let me illustrate, by a few examples, the action of some of the drugs upon various conditions, as exemplified by specific indications for their use.

Frequently patients will present themselves with a tongue that has a coating of a dirty white color, somewhat moist, and will tell you that they wake up in the morning with a bad taste in their mouths, which disappears almost wholly after eating. Give these patients 10 grains of sulphite of soda the *first* thing after arising and you will be surprised at the results; whenever you find this tongue give this remedy and the same effect will follow.

You have a patient that is the picture of nervous irritability — bright eyes, flushed face and a quick, small pulse. Administer small, frequent doses of tincture of gelsemium — made from the green root — and the condition fades almost like magic.

Another person has a high temperature, with a full bounding pulse, the picture of a sthenic condition. The prescription of tincture of veratrum in fractional drop doses, frequently repeated, will control the heart and lessen the temperature.

Still another patient has taken cold and complains of a pressure upon the chest and breathes with great difficulty. The administration of tincture of lobelia seed relieves the condition and renders your patient more comfortable.

Instances of this direct drug action upon abnormal conditions, and called to the attention by specific indications, could be multiplied to a very great extent. These, however, are sufficient to illustrate my position.

If these propositions are true, and it is easy to prove them for those who are so inclined, then it must be admitted that drug therapy is still a useful adjunct in restoring to the normal all perverted conditions.

Medical men who desire to secure the largest success in their chosen vocation must study all systems, from whatever source, in a critical and unbiased manner, and adopt those means which are best adapted for the relief of those seeking their aid.

Every careful and unprejudiced searcher after medical truth will, I think, admit that there is *some* good in all the various means and methods of the present day, and will endeavor to use them according to their indication.

To my mind, the most successful practitioner of the present, as well as the future, is that broad-minded person who seeks to extract the best from all methods and applies them in a scientific manner. Thus, drug therapy and physico-therapy are a part of one great whole. Each is the necessary complement of the other, when viewed from the right standpoint, and should be utilized for their remedial action as needed.

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“THE man of science is unworthy of the name if he disdains to listen to objections to a favorite theory.” — *James Anthony Froude.*

“WHEN the fight begins within himself,  
A man's worth something.  
... The soul wakes  
And grows. Prolong that battle through his life!  
Never leave growing, till life to come.”

— *Robert Browning.*

## ELECTRICITY AS A REMEDY.\*

BY G. BETTON MASSEY, M.D., PHILADELPHIA, PA.

*How Electricity Becomes a Remedy.*—The intimate connection between electricity and physiologic and pathologic processes has recently been considered by Prof. A. E. Dolbear, the eminent physicist of Tufts College, Medford, Mass. He deprecated all allusion to electricity as a force external to matter and independent of it. Electricity, light, heat, and chemic action are inherent properties of matter, electricity being the rotatory property of atoms, light the vibratory property, etc. They are but manifestations of atomic energy which are continuously present in the interchanges of atoms in the molecular activities incident to life. The higher the form of tissue the greater the amount of energy absorbed in cellular activities. "The factors of physiologic phenomena are the kinds of matter found in organic things and the kinds of motion and energy which give the kinds of matter their characteristic properties. The phenomena exhibited with these factors depend upon the inherent qualities of the atoms themselves, and it is certain that the old notions concerning their nature and possibilities must be profoundly changed, for the old is altogether inadequate and no one to-day knows enough to say what matter cannot do, for such a one makes ignorance do duty for knowledge. What can be strongly stated is that the variable factors are heat and electricity, for these determine chemic reactions in the body as well as out of it. For a long time heat was the only physical factor employed for chemic purposes in inorganic processes. Lately electricity has been utilized and has made possible many reactions which were either impossible or required a long time to effect, such as the reduction of alumina, the tanning of leather, and the making of potassium chlorate and sodium carbonate. Is it not altogether probable that the selective chemistry of tissues of all kinds is to be helped in like manner by employing the same agent, and that only present lack of knowledge prevents its successful use in promoting normal physiologic processes and destroying abnormal ones? Anthropologists are telling us there are few, if any, individuals of any race that are thoroughly sound, that all are in a more or less diseased condition. That means that cellular structure does not distribute to physiologic structure the proper kind and amount of physical energy needed. The trouble is with the cells, not the organs. And the trouble with the cells is instability, due to lack of available energy, ultimately electric, if there be any truth in what seems to be implied in all molecular structure, for every atom has its electro-chemic equivalent or electric energy, which is disposed in this way or that, as it is held more or less stable in its molecule."

\*"Conservative Gynecology and Electro-Therapeutics," F. A. Davis Company, Philadelphia, publishers.

This suggestive extract from Professor Dolbear's paper gives unquestionably the true basis of the medical value of electricity. In brief, it may be said, that by its use we have a means of altering at will the molecular activities, the selective chemistry, of both superficial and deep-seated parts of the body, and this is done, not by the addition of foreign substances or even a foreign force to the body, but by a simple alteration of its cellular activity, on which all organic functions depend.

To effect molecular activities in a special organ, which may be deep-seated, it is, therefore, apparent that we must so concentrate our "current" of rotatory molecular excitation from some artificial source external to the body that it may traverse that organ and be dense enough in transit to accomplish its purpose. This current, which, if constant, is always issuing from its source or to earth, is complete. To place the body in this path or circuit, we must apply two conducting contacts (electrodes) to its surface, or within its substance, between which the current will spread out as it traverses the intervening tissues. The electrode at which the current enters the body is called the positive pole, or anode, and is generally indicated by the + sign; that at which it leaves is called the negative pole, or cathode, denoted by the — sign. In addition to the molecular excitation referred to, which is present in all positions of the circuit through the body in proportion to the local density of the lines of flow, special chemic and molecular effects on living tissue attend the current at entrance and on leaving the body; hence the two poles have distinct and separate physical and therapeutic effects.

It is only necessary to add to these hints at the mode of action of electricity as an internal remedy that an intensification of the same molecular activities, by concentration of the current, is the explanation of the destruction of tumors of the body-surface and accessible cavities by ordinary electropuncture, where molecular activity is conducted to the final step of a resolution of tissue into its ultimate inorganic elements, and that in the phoretic powers of constant currents we have an invaluable assistant in the introduction into any given part of the body of medicaments in nascent form and capable of definite concentration in an organ without flooding the whole body with the remedy.

*Special Value of Electricity in Gynecology.* The foregoing remarks indicate the basis of a wide applicability of electricity to the cure of diseased organs in general. That its value in chronic affections of many kinds is but imperfectly appreciated by the profession is only too true (and this may be largely imputed to its but recent availability in measurable quantity), yet there are two special reasons for its recent agitation as a remedy in the diseases of women. One of these is the prevalence in nutritional and functional affections of the uterus and adnexa readily cured in this way, and by currents easily made effective, owing to an in-



sensitive nerve supply. The other reason is that it offers a choice of treatment in a class of affections notoriously maltreated at present by methods almost invariably involving the sacrifice of organs.

It is, of course, by no means within the power of electro-gynecology to displace the really necessary work accomplished by the modern methods of aseptic surgery, but it is within its province to demonstrate that mutilating and sacrificial operations can be restricted to cases legitimately requiring such measures of last resort by revealing the curableness of many affections apparently regarded as hopeless. The extensive prevalence of an attitude that regards the removal of an organ as both the proper and the only way to cure it can only be regarded as the sign of a mental epidemic of no mean proportions, particularly when such attitude is maintained only toward one set of organs.

To check microbic invasion and its consequences, remove pain, restore function, correct nutritional faults, check hemorrhage, cause retrogression of benign growths, cure malignant growths, and restore local and general health is a sufficiently broad platform for a single agency, and if these or many of these results can be accomplished by electricity without danger, risk, or mutilation, its claims for consideration as a method of choice over less advantageous procedures are imperative.

With powers so conservative yet vigorous at command, it is clearly the duty of the electro-gynecologist to protest against the too common practice that classes gynecology with major surgery alone, and results in sufferers from the diseases of women being referred at once to specialists in abdominal surgery. No organ should be subjected to a mutilating operation, certainly none removed from the body, until the powers of conservative medication have been intelligently tested; yet such is the haste in the performance of this work of last resort that our hospitals particularly have become the sacrificial temples of this new faith, in which women by the score, without previous attempt to cure, are persuaded to undergo operations dangerous to life and unwarranted by sound judgment, and which are followed by life-long consequences in those that recover that are either carefully concealed or else carelessly withheld from the knowledge before their consent is given.

*Special Value of Electro-gynecic Applications to the General Practitioner.* Besides the opportunity that is afforded to the family physician in the reference of his more difficult cases to the electro-gynecic specialist for an application of the highest skill in the art to a truly conservative restoration of health, a mere superficial employment of this agent by himself is calculated to be of immense service to his patients in the cure of many deviations of function, which may have seemed great enough to demand a reference to others. And this large field of usefulness is entirely wanting in risk, even in unaccustomed hands, if the vaginal methods of applica-

tion are adhered to and the intra-uterine applications withheld until greater expertness is gained.

That a large proportion of the ordinary cases of pelvic pain and discomfort are mainly due to deficient muscular and nervous tone, to relaxation, to the consequences of sexual excess, and to congestions and inflammatory sequels easily removable by the stimulant and tonic effects of vaginal applications of the induced current, is well known to every gynecologist who sees a large number of semi-acute cases, and there is no reason why these cases should not be treated by the intelligent general practitioner, with an office practice, particularly when continued delay or the application of harsh remedial measures will lead to an intensification of the trouble. This was well illustrated by a story told by Dr. Laphorn Smith, of Montreal, who had recommended a physician to purchase an induction apparatus, and on calling at his office some time subsequently was surprised at its worn condition. The physician explained matters by asserting that he had cured a considerable number of patients by its use. When asked what had been the matter with the patients, he could only reply that he did not know, but that they had been cured, nevertheless. The interests of exact science condemn such blind empiricism and routine, but, when it is remembered that the remedy employed by him is incapable of harm, no one can say that this physician was wanting in either common sense or humanitarian principles.

*Limitations.* An attempt to assign exact limits to the medical usefulness of an agency such as electricity will remain impossible for some time, owing to the varied nature of the conditions attending its employment. One may believe, for instance, that ergot, iodine, or other material agent may be thus easily understood, but the agent, in this case, being *the intensification or alteration of the molecular activities in a controllable manner*, with immediate results varying through an enormous range of current-strengths and qualities, the field of usefulness is more widely varied, and it is probable that conditions yet regarded as incurable in this way may merely require a heavier or more skillfully applied current. It is true, nevertheless, that many limitations to its usefulness are at present apparent, in the discovery of which a large and constantly increasing list of valuable uses has been established.

*No claims that electricity, or, in fact, anything else, is a cure-all are possible to the scientific mind, and, although these pages are largely devoted to a demonstration of its value in the definite conditions enumerated, it is not supposed that the reader is to neglect any simpler means that would be effective in the treatment of his cases;* for approved medical treatment, including the use of internal remedies, or of applications capable of being administered by the patient, are always preferable to remedial means that require the physician's personal attention, provided the same ends are accomplished.

A similar discretion is also urged upon the part of the reader in the choice between electricity and the knife, *electricity being advised only where it is equally certain in effect, free from danger, and more conservative of organs and their functions*; and, unless experience shows us that all or most of these advantages are assured as a result of the electric treatment of a particular case, we should not lose time by its employment. It should not be forgotten, nevertheless, that in cases of uncertainty on these points a course of electric treatment is incapable of doing harm, and, in the event of failure, leaves the patient in a position to derive full benefit from surgical treatment, which cannot be said conversely of patients who have failed of relief under a surgical operation.

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"HE who has the clearest and intensest vision of what is at issue in the great battle of life, and who quits himself in it most manfully, will be the first to acknowledge that for him there has been no approach to victory, except by the faithful doing day by day of the work which lay at his own threshold." — *Thomas Hughes*.

"NO two men take a thing just alike; and very few can sit down quietly when they have lost a fall in life's wrestle and say: 'Well, here I am, beaten, no doubt, this time; by my own fault, too. Now, take a good look at me, my good friends, as I know you all want to do, and say your say out; for I am getting up again directly and having another turn at it.'" — *Thomas Hughes*.

"EVERY honest occupation to which a man sets his hand would raise him into a philosopher if he mastered all the knowledge that belonged to his craft." — *James Anthony Froude*.

"LIBERTY of conscience cannot mean liberty to *do* what I like. . . . It is from my likings that I must be emancipated if I would be a free man." — *Frederick D. Maurice*.

"IN life and practice words are most real substantial things. They exercise a power which we cannot deny if we choose, but which we feel even when we are denying it. They go forth spreading good or mischief through society. Surely there must be something solemn and deep in their nature." — *Frederick D. Maurice*.

"HAPPY men are full of the present, for its beauty suffices them; and wise men also, for its duties engage them." — *Thomas Carlyle*.

"RIGHTLY viewed, no meanest object is insignificant; all objects are as windows, through which the philosophic eye looks into Infinity itself." — *Thomas Carlyle*.

# DEPARTMENT OF DIETETICS

## ALCOHOLIC BEVERAGES.\*

BY NATHAN S. DAVIS, JR., A.M., M.D., CHICAGO, ILL.

ETHYL ALCOHOL is the active principle of alcoholic beverages. It is produced by fermenting sugars with yeast. The difference in these beverages is due in part to the kind of sugar used, in part to the kind of ferment, and largely to by-products of fermentation that help to give flavor to them.

Alcoholic beverages do so much harm that their utility under any circumstances has been denied. It is true that they are *unnecessary* as beverages and even as medicines, for there are other things that can produce all the good results ascribed to them, but they do excite definite physiologic effects that are often forgotten because of their common use as drinks.

A man in health does not need to use alcohol; but it is so extensively employed the world over either to produce factitious exhilaration, or, by lessening sensibility, to mitigate fatigue and discomfort, sorrow and suffering, and it has been so largely and often so injudiciously used in disease, that it demands consideration. As the physiologic effects of beverages containing alcohol are due practically to this factor alone, it seems well to discuss these effects before describing the various forms of alcoholic beverages.

Alcohol is a *poison to protoplasm*, which checks the activities of living matter and may kill it. By a rapid abstraction of water it precipitates albumin. The latter may be quickly redissolved in water if it has not been left too long in the alcohol. After a certain time resolution is impossible. When alcohol is taken into the mouth, it causes a sense of warmth in the mucous membranes, causes them to be unusually congested, and forms upon the surface a pellicle of precipitated albumin that is rapidly washed off by the saliva. The latter is formed in unusually large amounts, because of the irritation of the mouth by the alcohol. In contact with the mucous membranes of the stomach, it causes similar changes. It also increases the formation of gastric juice, provokes more vigorous peristalsis of the stomach, induces congestion of its mucous membrane, and thus excites an excessive secretion of mucus. If a large amount of concentrated alcohol is swallowed, it will produce acute inflammation of the stomach. If moderate amounts are taken frequently, and especially upon an empty stomach, it will gradually cause subacute inflammation.

\* "Dietotherapy and Food in Health," published by P. Blakiston's Son & Co., Philadelphia, Pa.

The *chemical changes* of digestion are not affected by very dilute solutions of alcohol. Five to ten per cent, however, retards them, and twenty per cent stops digestion. Strong alcoholic solutions precipitate the pepsin of the gastric juice and coagulate the albumin of foods, making them less soluble. *Pancreatic digestion* is more easily affected by alcohol than is peptic digestion. From two to three per cent will retard it. Two tablespoonfuls of brandy delay the digestion of a meal in the stomach for a half hour.

Small doses of alcohol may be beneficial, stimulating the secretion of gastric juice and increasing peristalsis. For this reason, it has been used when the stomach is weak and is doing its work imperfectly. When the stomach is inflamed, alcoholic beverages aggravate the condition, certain of them produce acidity, as will be explained later, and are, therefore, counter-indicated in many digestive disorders. Intoxicating doses interfere with digestion, because of the nervous and vascular depression that they cause. Alcoholic beverages habitually used in generous amounts cause sufficient irritation of the mucous membrane to give rise to the formation of an excess of mucus that, enveloping food particles, prevents the digestive juices from gaining access to them, and, by coating the interior of the stomach, lessens the secretion of gastric juice.

Alcohol is *readily absorbed* from the stomach. It undergoes no change before being taken into the blood. By the portal vessels, it is carried to the liver and thence into the general circulation. When alcohol is absorbed from the stomach, it provokes a counterflow of water from the tissues into that organ four times as great as its own weight.

After absorption into the blood it forms a compound with hemoglobin, which causes that body to part with its oxygen more slowly than is natural. This in part explains the disturbed metabolism that exists after taking alcohol.

Imbibed in small amounts, alcohol causes the *heart* to beat faster and more forcefully. These effects are often noticeable before the beverage has been absorbed; in that case they are caused reflexly by irritation of the mouth, for they are also produced by sipping other pungent or hot fluids. In the *arterioles* it causes a muscular relaxation or loss of tone. Because of this the blood flows more readily from the arteries into the veins, blood pressure is lowered, and the heart beats faster. The pulse seems bounding, because in the intervals between the beats it is so completely emptied, the blood flowing rapidly into the capillaries and veins. The pulse is typically dicrotic. The habitual use of alcoholic beverages often produces persistent vascular paralysis. This is seen in the full red capillaries of the cheeks and noses of steady drinkers. Alcohol is often used because of its effects upon heart and blood vessels. It helps to make the circulation more uniform and the heart beat faster and more

effectively if the drug be given when the skin is blanched, the pulse slow and hard, and the heart feeble. These conditions are met with in collapse and occasionally in acute diseases accompanied by intense congestion of viscera and sometimes in infections.

If alcohol is used under these circumstances, it must be remembered that frequently repeated doses will cause its accumulation, when its sedative effects upon the nervous system will show themselves. A large dose is also counter-indicated for the same reason. The so-called cardiac stimulation of alcohol is of short duration and not well maintained, either in those accustomed to its use or in others to whom it is given repeatedly in full doses. There are other medicaments capable of producing similar results, and that by constant repetition do not produce sedation. When the effect of alcohol upon the heart has worn off, the latter beats less vigorously and more slowly than at first; in other words, its stimulation of the heart is followed by a period of depression. The heart has been known to stop suddenly when a pint of whiskey or more was drunk at once. This is probably due to strong reflex action produced by irritating the mouth, gullet, and stomach. From the fact that depression follows stimulation, it is evident that alcohol does not act as a food to the heart muscle, but as a spur or stimulant. This stimulant effect is obtained only from small doses. Large ones directly depress and paralyze the heart. Very large ones cause it to dilate.

The *habitual use* of alcohol makes the heart actually beat faster than is natural. For instance, according to B. W. Richardson, one ounce of alcohol daily will increase its beats 430, two ounces, 1,872; four ounces, 12,960; six ounces, 30,670. This makes the heart do much more work than it does when alcohol is not taken. That a period of unnatural enfeeblement should follow its use is not, therefore, surprising, especially as it does not feed the heart.

There is much discussion as to whether or not alcohol is a *food*. If a food is defined as anything that can be decomposed in the tissues and eliminated in a form different from that in which it enters, alcohol is a food. The inadequacy of this definition is self-evident. Water is a most valuable food, yet it is not decomposed, but eliminated as ingested. Many poisons are decomposed, at least in part, in the body, as most foods are. If food is defined as a body that contributes to the growth of cells in their multiplication, and to the generation of heat and energy by them, it is very questionable if alcohol can be classed as a food. When limited amounts, not exceeding one or one and a half ounces a day, are taken in small doses at a time, it seems to be decomposed by the tissues and does not appear in the exhalations from the lungs or skin or in the urine. This would suggest that it has a food value.

Its effect upon heat and energy production will be referred to later.

Hammond found that when he was upon an insufficient diet and losing weight, the addition of a little alcohol made him gain. This also suggests its having a food value. It is often, although not uniformly, noticed that habitual drinkers put on flesh. This does not, however, demonstrate that the alcohol has entered into the structure of cells in a beneficial way. It *modifies oxidation* processes, prevents the complete utilization of foods, and causes a retention of fats and some waste-products in the system.

The fact that it does not appear in the excretions of the body when not more than one ounce is taken in a day hardly demonstrates its utility as food. The most recent researches point to its being a poison to protoplasm, but it is probable that this amount may be taken without noticeable impairment. Hutchison says, "Alcohol is a protoplasmic poison or anesthetic, but is itself easily burnt up in the body." Because of this effect, he continues: "If alcohol gets access to the cell and partly paralyzes or anesthetizes it, the cell will lose its power of breaking down those compounds, such as fat, with which it has, even in a condition of full activity, most difficulty in coping. Alcohol, then, saves fat from combustion; in other words, it is a fat sparer. It also appears, though with greater difficulty, to be able to spare carbohydrate, but it is exceedingly doubtful whether it is ever able so far to paralyze the cell as to destroy its power of dealing with proteid." It exerts much the same influence upon cells generally, interfering with or lessening their normal functions, that it does upon red blood corpuscles, with whose power to take up and set free oxygen it interferes. It does this by making with hemoglobin a compound that is an inefficient oxygen carrier. Is it not probable that it unites similarly with some cell constituents and modifies their functions? We know that when applied directly to cells it coagulates a part of their albumin, as has been explained of its topical action on mucous membranes.

One ounce of alcohol should yield as much heat by combustion as one ounce of butter — about two hundred calories. But practically this is not the result. In 1851 N. S. Davis demonstrated that *alcohol lowers temperature*. Two factors help to cause this loss. Even small doses dilate the peripheral arterioles, bringing thereby a large amount of hot blood rapidly to the surface of the body, from which radiation quickly takes place. Therefore, more rapid radiation of heat is one factor causing a lowered temperature when alcohols are drunk. Considerable doses also lessen oxidation or heat-production. The fact that bodily temperature is thus lowered has caused those who send men into cold regions to forbid the use of alcohol, because it increases greatly the liability to freezing.

Alcohol has been advised in fevers as an antipyretic. It has, however, the same mode of action and the same faults as other chemical antipyretics and is less efficient than several of them.

(To be continued.)

# EDITORIALS

## Journal of Therapeutics and Dietetics

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PITTS EDWIN HOWES, M.D., *Treasurer*

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PITTS EDWIN HOWES, M.D., EDITOR.

JAMES MARSHALL FRENCH, M.D., ASSOCIATE EDITOR.

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### THE IMPORTANCE OF BEGINNING EARLY.

It is of the first importance in the treatment of disease, that the physician should be called early, and have the chance to institute the proper treatment at the very beginning of the case. There is no way of escaping this conclusion, except by taking refuge in the Oslerian doctrine of the inutility of medical treatment, and admitting that the physician can do nothing for a sick man except to diagnose his case, and then sit idly by and see him die. This is bald therapeutic nihilism, and reduces the doctor to the level of a man nurse. Such is not the doctrine which we teach.

Every physician who is worthy of the name understands and admits the fact that most conditions of disease are more readily brought under control, their symptoms are less severe, dangerous complications are less likely to occur, and the final outcome is more likely to be favorable, when the case is put into his hands at the earliest possible moment, than it is when the patient and his friends wait until they have exhausted all their resources before calling the doctor, and the disease has thus become fully developed before it is turned over to his care.



When the doctor is called at the outset, he does not have to wait until he can make a positive diagnosis before beginning the treatment. It is not his duty to spend a week in watching the development of the malady, meanwhile making daily visits of inspection, but lifting no hand in defence of the imperiled vital forces. Instead of this, it is his privilege and his duty to treat the diseased conditions as he finds them, and as they are indicated by the earliest symptoms of the case. He knows how to meet the elementary conditions of disease, even before the causes have manifested themselves. Knowing the rational indications of treatment, he is often able to prevent the development of pathological lesions, and as a result the patient is restored to health without ever knowing the name of his disease. To be sure, in the eyes of the pathologist, this is an inexcusable sin, and on no account to be tolerated. But the patient is very well satisfied, and as it is the patient who is supposed to pay the bills, the attending physician ought not to be the one to find fault. If a live patient is better than a dead one, then his recovery ought to be satisfactory to all parties.

It may be, indeed, that the doctor is not an apostle of the jugulation of fevers, and does not believe in the aborting of disease. To be sure, there are but few doctors, at least among those who are on the firing line, and treat their patients at first hand, who, when they are called to treat a case of fever in the formative stage, do not strive to "break it up" — and what is that but to abort it, jugulate it, make it not to be a fever? Especially, what one of them does not encourage the patient and his friends to hope that such a result may be obtained? And should he fail of bringing about this much-to-be-desired termination, what one does not gently intimate that he might have succeeded better if he had been called sooner? And what is this but to say that under more favorable circumstances the disease might have been aborted? On the other hand, should he prove successful, the skeptic, who is usually the physician living next door, will say that the disease did not exist, except in the lively imagination of the attending physician. But who cares for that, so long as the patient comes out all right? It is better to cure a malady than to let the patient die; it is better to abort it than to suffer it to run its course; and it is better to prevent it than to abort it.

As a practical illustration of this course, the writer will note briefly a case but recently under his care. About one o'clock in the afternoon, he was called in haste to see one of his patients, a woman of seventy-six years, who had been ailing with a cold for several days, and now was taken suddenly worse. He found her suffering from a severe chill, with a temperature of 105 and a pulse of 120, and presenting the usual symptoms of an attack of pulmonary congestion, which usually constitutes the first stage of pneumonia. But having been called in the very nick of

time, he was able to institute prompt measures of treatment, with the result that, while at the close of the second day there was marked crepitation in the upper lobe of the left lung, and the temperature was 103.5, within the next twenty-four hours the temperature went down to normal, the lung was nearly cleared up, and the patient was on the high road to recovery. This result, in the writer's judgment, was due very largely to promptness in beginning treatment, and could not have been secured had the patient delayed calling him until twelve hours later.

We believe that success in the practice of medicine, so far as that success depends upon relieving suffering and prolonging life, depends more upon beginning early in the treatment of the case, than upon any other element whatever, excepting, of course, the knowledge and skill which are necessary to enable a physician to take advantage of the opportunity. From the patient's point of view, it means more years of life and better health; from the doctor's, it means more first calls, but fewer cases of serious and fatal disease. The bills will be smaller on the average, but there will be more of them, they will be sent in oftener and paid more promptly.

If the points we have been trying to emphasize are true, then it follows as a practical deduction, that it is the duty of the physician — and we are speaking especially of the general practitioner, the family physician — to educate his patients and his families to send for him at the earliest indications of acute disease; and to do this not as a favor to him, but to themselves.

J. M. F.

#### BOOK REVIEWS.

ALL books reviewed in this department will be sent postpaid, upon the receipt of the quoted price. Send money order or bank check, making payable to Pitts Edwin Howes, treasurer.

*The Physician's Visiting List for 1908.* Contents: Calendar 1908-1909; New Complete Table for Calculating the Period of Utero-Gestation; Table of Signs; Incompatibility; Poisoning; Metric System of Weights; Table for Converting Apothecaries' Weights and Measures into Grams; Dose Table (new U. S. P., 1905); Asphyxia and Apnea; Comparison of Thermometers; Blank Leaves for all that pertains to Physician's Accounts. Twenty-five patients per day, \$1.00; 50 patients per day, \$1.25. Perpetual edition, 1,300 names, \$1.25; 2,600 names, \$1.50. P. Blakiston's Son & Co., 1012 Walnut Street, Philadelphia.

This old and well-established visiting list will be welcome to its many users, who have come to look upon it as an old friend, whose non-appearance would be sadly missed.

# Journal of Therapeutics and Dietetics

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## COLLECTIVE INVESTIGATION OF DRUGS.

With this issue we shall enlarge the scope of our department of Drug Studies so as to include a collective investigation of the remedies considered from month to month, by the readers of the JOURNAL.

It is our plan to present each month a summary of the important facts known concerning some one drug, choosing those drugs which are of sufficient importance to be of general interest, and whose properties and uses have not been thoroughly worked out and are not fully understood.

Following this preliminary paper we ask our readers to join with us in the study of the drug, both by testing it in their own practice and by collecting the experience of others. Send all such results *direct* to the Associate Editor, John Marshall French, M.D., 2 South Main Street, Milford, Mass., who will have charge of this department. Some of these letters will be printed from time to time and all of them will be used, due credit being given, in the preparation of a collective investigation report on the drug in question, which will be published when sufficient information shall have been obtained. Questions and replies concerning the drugs taken up for study will be most welcome, and it is earnestly hoped that all our readers will join most heartily in extending our plan.

This department of Drug Studies will differ from the clinical departments to be found in many journals, mainly in taking as its objective point *the study of drugs and their uses*, rather than *that of diseases and their treatment*. We wish to eliminate, as much as possible, the consideration of disease in its entirety and confine our investigations to the various conditions for which drugs are found to be curative. This is the *important objective study* of drug therapy. When we understand that certain drugs are opposed to certain conditions, we are in a position to prescribe them intelligently and successfully. All diseases are made up of various complex conditions. When we are able to dissect these and adapt our drug therapy accordingly, we shall be victorious in our endeavor to lessen disease.

The following drugs have been selected for early consideration: (1) *Verbena hastata* (*will be found in this issue*); (2) *solanum carolinense*; (3) *populus tremuloides*; (4) *echinacea angustifolia*; (5) *lycopus virginica*; (6) *cactus grandiflorus*.

This list may be changed should such a course seem desirable. If there are any drugs you would like to see included, send in their names. We ask you to help us to make this departure a success.

# DEPARTMENT OF THERAPEUTICS

## BELLADONNA.

BY FRED G. PHILLIMORE, M.D., BOSTON, MASS.

THE synonyms of the plant are deadly nightshade, dwale, black cherry, herba belladonna, beautiful lady, etc.

*Description.* Belladonna is a perennial herb with a thick branched, fleshy creeping root and slightly downy stems, about three feet high. The leaves are lateral, mostly two together; they are ovate, soft, and of a dull green color. The flowers are solitary, large stalked, and drooping, of a dull purple color at the edge, and paler inward. The calyx is green and five-pointed, while the corolla has a short tube limb, divided into five equal segments. The stamens are five; the filaments are as long as the corolla tube; the anthers are four lobed and cordate; the stigma are two lobed; the fruit, two celled and many seeded berry; the seeds are reniform.

*History.* This plant is common to Europe, grows among ruins and waste places, blossoming from May to September, and the berries mature in September.

The whole plant possesses poisonous properties. The parts used in medicine are the leaves, and are gathered while the plant is in bloom. When dry, they are of a grayish green color, with scarcely any odor and of a bitterish taste. They readily yield their medicinal virtues to water and alcohol. When the root is used it is taken from plants three years old, in the springtime. It has a slightly bitter taste and is soluble in water or alcohol.

*Constituent Parts.* According to the analysis of Professor Brande, belladonna contains supermalate of atropa, pseudotoxin, malate of potassa, salts, wax, chlorophyll, phytocolla, gum, starch, albumen, and lignin.

*Properties and Uses.* Either the leaves, roots, or berries of belladonna will induce delirium, stupor, dilatation of the pupil, convulsions, efflorescence of the skin, and death if taken in large quantities.

Sometimes, from a constitutional peculiarity, an ordinary dose will bring on very alarming symptoms and compel us to desist, while, on the other hand, some persons can take large doses without any ill effect being produced, thus showing the two extremes.

Buchanan's "History of Scotland" records how the Swens were destroyed by the Scots, with the juice of the belladonna berries mixed with wine, which was given to the Danes during a truce.

In 1801, Hahnemann published a paper on the value of belladonna for preventing scarlet fever, and in 1820, Professor Dusterling reported a confirmation of the Hahnemann article.

In Braithwaite's "Retrospect," Part 38, page 175, will be found an extensive article where an ointment of belladonna is highly recommended for carbuncles and boils.

Professor Dubois has stated that cancer has been relieved and cured by the use of belladonna.

Trousseau says that belladonna has always proved successful with him in the treatment of neuralgia. Hutchinson and Copeland also report good results from belladonna in all forms of neuralgia. In Braithwaite's "Retrospect," Part 10, page 520, is an article on neuralgia where the external and internal use of belladonna and quinine is highly extolled.

Dupuytren has combined belladonna with acetate of lead in the treatment of spasmodic diseases and reported good results.

Moranda, Trousseau, Blanch and Claude, all say that in the treatment of incontinence of urine there is no remedy superior to the belladonna.

In whooping-cough I do not know of any remedy that is its superior. In constipation, Trousseau declares that it is the remedy, *par excellence*, for habitual constipation.

Professor David reports two cases of strangulated hernia where the external and internal use of belladonna led to the reduction of strangulated hernia which seemed to demand an operation.

In the *Gazette de Herbdomarie* is reported a case of inguinal hernia where taxis had failed, but the use of a poultice of belladonna and flaxseed had permitted the reduction to be made.

A small piece of belladonna plaster over the ovaries and specific medicine belladonna internally has produced some excellent results.

Rigidity of the uterus in labor can be controlled by belladonna ointment applied to the os. Dr. Baker, in the *American Medical Monthly*, has written an exhaustive article on the shortening of labor by the use of an ointment of belladonna and lobelia.

Dr. Stillie says that in small doses belladonna is one of the drugs that we find useful in the treatment of laryngitis.

Professor Hutchinson has reported many cases of traumatic tetanus cured by belladonna; the specific action of the drug upon the pupils was followed by an abatement of the spasms.

In epilepsy, belladonna should be given in large doses for some time, until you have produced the specific effect. It may be several months before relief is obtained but it will come if the belladonna is persisted in for a sufficient length of time.

For its use in ophthalmic work, I refer you to Braithwaite's "Retrospect." (Part 13, page 311.)

In Braithwaite's "Retrospect," Part 24, page 116, and in the *London Medical Journal*, August, 1892, page 721, will be found the reports of several cases of lead colic that were relieved and cured by the administration of belladonna.

Where is there anything better than belladonna for the relief of that harrassing complaint, chorea?

Belladonna is an old remedy in the arresting of the mammary secretions, and we all know the benefit to be derived from its use.

Stillie, Anderson, and Mussey have all reported the great good to be derived from the belladonna in the treatment of opium poisoning.

As a prophylactic it has been used in scarlet fever since 1801, and always with good results.

#### THERAPEUTIC PROPERTIES OF BELLADONNA.

Professor Dubois in summing up the therapeutic uses of belladonna, makes the following statments, viz. :

1. That belladonna is the best remedy known for photophobia.
  2. In certain cases it is a good hemostatic.
  3. It is a prophylactic in scarlet fever.
  4. It is the remedy for neuralgia.
  5. It is the remedy for external pain.
  6. It will relieve and has cured cancer.
  7. It is of real efficacy in strangulated hernia.
  8. Its property of facilitating labor in spasmodic constriction is incontestable.
  9. It produces good results in fissures of the anus.
  10. That belladonna should be placed in the front rank of medicine for the good it has proven to be in all spasmodic strictures of the rectum, anus, vulva, urethra and bladder, also in nephritis, colic, and hemorrhoids.
- Preparations and Dosage of Belladonna:* Ext. belladonna,  $\frac{1}{4}$  to  $\frac{1}{2}$  gr.; fl. ext. belladonna root, 1 to 5 m.; tinct. belladonna leaves, 1 to 30 m.; spec. belladonna,  $\frac{1}{2}$  to 1 m.; normal tinct. belladonna,  $\frac{1}{10}$  to 2 m.; atropine sulphate,  $\frac{1}{120}$  to  $\frac{1}{60}$  gr.

*Combinations of Belladonna:* Unguent belladonna; emplastrum belladonna; syrup belladonna compound (belladonna, elecampane and pruni vig.); pill belladonna compound (belladonna, morphia, strychnine); liniment belladonna (belladonna, opii, dilute alcohol); belladonna poultice, (extract belladonna, flaxseed, slippery elm, or rye meal).

*Incompatibles:* Alkalies, tannin, vegetable astringents.

*Antidotes:* Stomach pump, iodine, mustard emetic, tannic acid, zinc sulphate, morphia, brandy, coffee, capsicum, ammonia internally and externally.

**SANGUINARIA CANADENSIS.**

BY PITTS EDWIN HOWES, M.D., BOSTON, MASS.

POSSIBLY there is no greater temptation which comes to the medical man, who is actively engaged in the practice of his profession, than that of eagerly adopting the new remedies which are constantly being brought to his attention, and neglecting the use of the old standby's which have served him faithfully in the past.

*Sanguinaria canadensis* has always found a place in my medicine case, but my use of it has been a limited one, being confined wholly to the treatment of those diseases where I would get a particularly obstinate cough. A cough that nothing else would touch, has frequently yielded like magic to the *sanguinaria*.

*Sanguinaria* grows in all parts of the United States. It grows in rich, moist localities and is one of the first of our plants to blossom. The rhizome is the part used in medicine.

**PHYSIOLOGICAL EFFECTS.**

The action of the drug depends very much upon the size of the dose. In small doses it is a heart stimulant, in large doses a powerful cardiac depressant. In small doses it is a gastric tonic, while large doses cause distressing gastritis and serum emesis. Excessive doses have produced death without any vomiting being caused thereby. It exerts a strong influence upon the respiratory mucous membrane. The fraction of a grain acts as a mild expectorant. Increasing this dose will produce bronchial irritation with a loose rattling cough and considerable expectoration. A still larger dose will induce congestion of the bronchial tubes with spasmodic cough and a tenacious sputa. Pushed still further we get stridulous breathing and sighing respiration.

Dr. Rutherford has shown that *sanguinaria* is a powerful biliary stimulant increasing both the solid and watery constituents of the bile. It also acts upon the salivary glands, causing copious salivation.

**THERAPEUTICS.**

*Sanguinaria* is one of the most powerful drugs at our command and deserves, and will repay, careful study. It may be said to act upon the skin and mucous membrane, upon the digestive and respiratory system, upon glandular structures and muscular tissue, and upon the cerebrospinal system.

The action of *sanguinaria* upon the skin is limited but peculiar. Applied in powdered form to fungous growths it is escharotic. One ounce of the tincture added to a pint of hot water makes an excellent stimulating

wash for old indolent ulcers, when the exudations are foul and unhealthy. Internally it is useful in psoriasis, pityriasis, and other scaly eruptions. Sanguinaria will antidote the poison of rhus tox. In small doses, well diluted in hot water, it will act as a diaphoretic.

Sanguinaria exerts an extremely potent influence on the mucous membrane of the nasal cavity. Many coryzas are quickly cured by its use, especially those where there is a free, acid, burning, watery discharge, which causes an indescribable rawness of the membrane, with loss of smell and frequent sneezing. When these symptoms are especially active, upon the right side, sanguinaria is the remedy.

Many cases of nasal polypi have been reported cured by the snuffing up of powdered sanguinaria several times a day. In the common catarrhal sore throats, so frequently met, sanguinaria will prove efficacious, used both internally and as a gargle.

This remedy is specifically indicated when the throat feels as it had been scalded by drinking something hot. The dryness is unrelieved by drinking, although drawing cool air over it through the mouth renders the patient more comfortable. These disagreeable feelings are always worse on the right side.

In minute doses, the fraction of a drop, it is very useful in certain stomach troubles,—those where your patient complains of a burning epigastric pain, aggravated by eating, unrelieved by vomiting, and increased by pressure. When the food undergoes chemical decomposition and gas is evolved in large quantities, sanguinaria will generally change the action of the stomach, and digestion becomes complete. When the mucous membrane is congested the flatus formed by fermentation is retained by a spasmodic constriction of the cardia. Its irritation is reflected upon the lungs through the pneumogastric nerve, exciting a feeling of tickling in the entrance of the trachea, with sympathetic cough. This peculiar dry cough will not yield to expectorants, and often persists for hours. The sanguinaria will relieve. It not only relaxes the constricted cardia, thus allowing the flatus to escape, but excites a healthy reaction on the whole surface of the stomach, esophagus, and fauces. Chronic catarrh of the stomach will frequently be cured by small doses of the sanguinaria.

In the diseases of the lungs, sanguinaria finds an important place. In both bronchitis and pneumonia, when the cough is a troublesome factor, sanguinaria will prove beneficial.

The physicians of the early days of American practice used sanguinaria much more freely for coughs than those of to-day. They attributed to this remedy the power of curing incipient phthisis pulmonalis.

Many physicians have testified to curative properties of sanguinaria in acute edematous laryngitis and croup. In the latter disease, both the ordinary and the pseudo-membranous forms, the acetous syrup seems to



have the preference. This may be made by adding 4 gr. of *sanguinaria* to  $\mathfrak{J}\text{iv}$  of vinegar; steep, and put in one ounce of sugar to form syrup. Dose: a teaspoonful as often as indicated. The use of *sanguinaria* in croup will often render the operation of tracheotomy unnecessary.

This remedy will also act upon the liver and tonsils. In incipient tonsillitis it should never be forgotten as it will abort the inflammation if used early. When there is enlarged tonsils the use of a gargle of *sanguinaria*, well diluted with water — say  $\mathfrak{J}\text{i}$  to  $\mathfrak{J}\text{iv}$  aqua — will bring them back to their normal condition and prevent the former tendency to contract tonsillitis.

*Sanguinaria* is a grand remedy in some forms of headache. The *sanguinaria* headache is peculiar and easily remembered. The pain commences in the back of the head and, rising upwards, spreads over the head, and finally settles in the brow above the right eye. There is great intolerance to light and noise. There is nausea and vomiting, sometimes accompanied with chilliness. If there are flashes of heat through the body, or if the palms of the hands and the soles of the feet burn, or if the urine is scanty and dark at first, becomes later profuse and clear, *sanguinaria* is the more specifically indicated.

When, in acute rheumatism, the poison attacks both the muscular and nervous tissues at the same time, *sanguinaria* will prove an excellent remedy.

All this testimony educed from a large number of physicians who have successfully used this drug shows us what a copious field is covered by *sanguinaria canadensis*.

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“WHAT imports

Fasting or feasting? Do thy day's work; dare  
Refuse no help thereto, since help refused  
Is hindrance sought and found.”

— *Robert Browning.*

“COME, bring thy gift. If blessings were as slow  
As men's returns, what would become of fools?  
What hast thou there? a heart? but is it pure?  
Search well and see; for hearts have many holes.”

— *George Herbert.*

“THANK God every morning when you get up that you have something to do that day which must be done whether you like it or not. Being forced to work, and forced to do your best, will breed in you temperance and self-control, diligence and strength of will, cheerfulness and content, and a hundred virtues which the idle will never know.” — *Charles Kingsley.*

## DRUG STUDIES.

## VERBENA HASTATA.

BY J. M. FRENCH, M.D., MILFORD, MASS.

VERBENA HASTATA, common or blue vervain, is a plant well known in most parts of the United States, being widely distributed throughout the country. It is an elegant perennial herb, growing along roadsides and in dry, grassy fields, reaching a height of from 3 to 6 feet, and flowering from June to September. The root is the part mostly used in medicine, though the leaves are sometimes employed, but are less active.

Felter and Lloyd give its properties as tonic, emetic, expectorant, and sudorific. Scudder says it relieves irritation of the stomach and intestinal canal, and promotes digestion and secretion. Paine says it has been used with good results in rheumatism, gout, and piles. Day advocates its use for the cure of intermittent and remittent fever, and also for the opium habit. Griffin uses it in the form of an infusion in ivy poisoning. Boericke in his "*Manual of Homeopathic Materia Medica*," says it affects the skin, promotes the absorption of blood, and allays pain in bruises, is useful in congestion and intermittent fever, and as a remedy for poison oak. These statements cover most of the uses of verbena as taught by the older writers. But if these were all the uses of the plant, it would not be worth further study. For all of these uses we have at hand other and better remedies. What we need is not more remedies similar to those we already possess, but *better remedies than we now have for particular conditions of disease*. It is in the hope that verbena may prove to be such a remedy that I am calling attention to it in this paper.

Some time in the late nineties, Dr. H. D. Fair, of Muncie, Ind., announced through the columns of the *Alkaloidal Clinic*, that he had found verbena remarkably effective as a remedy for epilepsy.

Soon after this, Prof. G. H. French, of Carbondale, Ill., reported in the same journal that he had learned that the plant possessed a local reputation among the laity in epilepsy, and that he had himself used it in some cases with success.

These reports stirred up many physicians in different parts of the country to give the remedy a trial, and a considerable number of them reported their results in the *Clinic*. The concurrent testimony of these clinical observers may be said to have established one important point, and one only. It is this:

*Verbena is a remedy of great value in some cases of epilepsy, while in others it is of no benefit, and may even prove injurious.*

In this general conclusion all reports agreed. In favorable cases the drug was found to exercise a decided influence over the nervous system of

epileptics. It was not claimed that the convulsions were usually stopped at once, but they were made lighter and the intervals became longer, while after a longer or shorter time the attacks ceased entirely, and at the time of making the reports had not returned. It must be remembered, however, that in a disease of the nature of epilepsy, it is difficult to say when the patient is cured beyond the liability of recurrence. No period of freedom from convulsions for a less time than two years can be considered of much value, and some have even claimed nine years as necessary to establish a cure. It is evident, then, that in order to establish the value of a remedy in this disease, two elements are necessary, — a large number of observers and a considerable length of time.

Nevertheless, in a disease as serious and intractable as epilepsy, any drug or other remedial measure which holds out a reasonable chance of being an improvement on the means already at our command deserves thorough trial and careful investigation. Impressed by this fact, I wish to call the attention of the readers of the JOURNAL to this remedy, and ask them to report any experiences they may already have had with its use, whether the results have been favorable or unfavorable, and also to make use of it in any cases of epilepsy for which they may not have found a satisfactory treatment, and report the results. I have said that one point may be regarded as settled, — the value of verbena in some cases of epilepsy and its uselessness in others. The next point to be settled is this: *In what class of cases is it beneficial, and in what is it useless?* In other words, What are the indications for its use? If this point can be settled, we shall have learned something worth while.

A word as to the preparations and doses commonly employed. I think the first cases reported were treated with the solid extract. Then the Abbott Alkaloidal Company prepared a concentration or purified extract, 1 gr. of which was said to represent 30 grs. of the drug, and this was at first furnished in  $\frac{1}{2}$  gr. tablets, later in  $\frac{1}{4}$  gr. The usual dose ranges from 1 to 6 tablets three times a day, beginning with the smaller amount and gradually increasing to the larger. A fluid extract is made by the Wm. S. Merrell Chemical Company, of Cincinnati, and this is preferred by one observer. Most of the results have been obtained with Abbott's verbenin, and my only experience has been with this. It is said that the extract has the effect when used in large doses of relieving the constipation usually attendant upon epilepsy, but I have not observed any such effect from the concentration. I will say further, that I have never seen any unpleasant effects from the use in any dose in which I have employed it.

My personal experience in the use of verbena has been limited to three cases. The first came under my care five years ago, and has continued under treatment until the present time. The patient was a woman of

sixty, who had been an epileptic since the age of puberty, but in whom the attacks as a rule had not been especially frequent or severe, and whose mental faculties had not suffered seriously as a result of the disease. A short time previously she had been under the care of a prominent Boston physician, who had given her what was known as the compound bromide treatment, which had proved decidedly injurious to her instead of beneficial. Her attacks became more frequent and severe, and her nervous system suffered greatly. Under these conditions she came to me for treatment. I studied her condition carefully, regulated her diet and habits of living, looked after any possible exciting causes, treated general symptoms on general principles, and then began giving her verbenin, one tablet three times a day, and increasing in due time to six tablets three times a day. After about ten weeks, she had no attacks for twenty-two months, her general health improved, the nervous symptoms disappeared, and the outlook seemed favorable for a cure. Then under stress of living, causing a strain upon the nervous symptoms, she suffered a relapse, and suffered from frequent attacks for a period of several months. Disheartened, I stopped verbenin, and gave her for a few weeks a new remedy, *solanum carolinense*. Under this she grew worse, and suffered from the worst attack she ever had. Finally I persuaded her to return to verbenin, which she did; and now, for a period of twenty-seven or twenty-eight months, she has been free from attacks, her nervous system is restored, and her general health is good. She still uses a regulated diet, and is very careful as to her habits of life.

My second case was that of a young lady of twenty-two, who had been an epileptic for ten years. There was no evident cause, no connection with menstruation, but some constipation and derangement of digestion. She had taken bromides with benefit, which, however, was only partial, and she came to me on account of my success with the first case. I gave her the same general treatment as the preceding. This was continued for about three weeks, during which time she became distinctly worse, and at the end of the time I advised her to return to the bromides, which did exercise a certain degree of control over the convulsive attacks. I do not know her subsequent history.

The third case has now been under my care about five weeks. It is that of a girl of sixteen, whose first attacks occurred about five years ago, coming on in connection with the establishment of menstruation, and who has been especially liable to attacks at the time of the menstrual periods. I am looking out for all possible exciting causes, and am regulating her diet and modes of living as in the previous cases. It is yet far too early to predict anything concerning her, except that the outlook is hopeful.

My present contributions to the therapy of verbenin are the following, which are suggestions merely; it is too early for conclusions:

(1) *The cases most likely to be benefited by verbena are those in which the action of the bromides is unfavorable.*

(2) It is suggested by those who have used solanum and verbena in epilepsy, that these two drugs are complementary to each other, the one helping those cases which the other does not.

(3) It is further claimed that verbena is specially adapted to cases of menstrual epilepsy, that is, those brought on or aggravated by menstruation.

(4) The action of verbenin on the nervous system is that of a tonic, brightening up the patient's mental powers and giving him a more cheerful aspect.

(5) I have seen no indications that verbena is an emetic, expectorant, or sudorific. The new therapy will overthrow the old.

I ask all my readers who have the opportunity, to make a trial of verbena in epilepsy, and report their results to me. Their reports will either be published as sent, or used in preparing a collective-investigation report, to be published later, proper credit being given.

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“KNOW, not for knowing's sake,  
But to become a star to men forever.”

— *Robert Browning.*

“WHEN thou dost purpose aught within thy power,  
Be sure to do it, though it be but small;  
Constancy knits the bones, and makes us stout  
When wanton pleasures beckon us to thrall.”

— *George Herbert.*

“Think, as if man had never thought before!  
Act, as if all creation hung attent  
On the acting of such faculty as thine,  
To take prime pattern from thy masterpiece.”

— *Robert Browning.*

“BE thrifty, but not covetous; therefore give  
Thy need, thine honor, and thy friend his due.  
Never was scraper brave man, get to live;  
Then live and use it; else it is not true  
That thou hast gotten. Surely use alone  
Makes money not a contemptible stone.”

— *George Herbert.*

## THERAPEUTIC NUGGETS.

**VINEGAR.** This agent will form a cooling grateful drink in fevers, especially if the tongue is deep red with dark brownish coat. It will allay thirst, neutralize any excess of acidity and also increase the excretion of the urine; ℥iv to ℥viii may be added to ℥iij of water and the patient be allowed to drink as needed.

**ACHILLEA MILLEFOLIUM.** This agent exerts a tonic influence upon both the mucous membranes and the venous system. It has been found to be of great value in hemorrhagic conditions, especially if the hemorrhage is not profuse. It may be given in doses of ℥i to ℥ij of the infusion (made by macerating ℥j to Oj aqua), 5 to 30 gtts. specific medicine; volatile oil, 5 to 20 gtts. These preparations may all be made more pleasant by the addition of a few drops of the oil of anise.

**ACTÆA ALBA (*White Cohosh*).** This drug produces its effect particularly upon the reproductive organs of the female, and favors waste and nutrition. General atony and impairment of the nervous system are the keynotes of its usefulness; when spasmodic diseases are due to derangements of the menstrual functions actæa will prove beneficial. Dose: specific medicine actæa, 1 to 20 gtts. Usual prescription: R. Spec. med. actæa, gtts. xx; aqua, ℥iv; mix. Sig. ℥j, from one to three hours.

**ALNUS (*Tag Alder*).** This drug will prove valuable in the treatment of scrofulous affections, particularly if there is enlargement of the glands with suppuration. In chronic skin diseases that produce scaly or pustular eruptions alnus should not be forgotten. The special field of this agent is to improve nutrition and prevent waste. Those who can procure the fresh bark will be best served with the infusion (fresh alnus bark, ℥j; aqua, Oj) given in wineglass doses. Specific alnus; Dose: 1 to 20 gtts.

**ABIES CANADENSIS (*Hemlock Spruce*).** The alcohol preparations of this agent are usually known as pinus canadensis. These preparations are of much value when a mild and gentle stimulating effect is desired. They are particularly valuable in catarrhal disturbances of the mucous tissues when there is much relaxation and paleness of color. It may be given in 5 to 30 gtts. doses of the tincture, and 2 to 10 gtts. of specific medicine, preferably in equal parts of water and glycerine. Its special indication is a state of asthenia. Must never be given when there are any signs of inflammation.

**PHYSICAL THERAPY.****A PLEA FOR MORE PHYSICO-THERAPY.**

BY CHARLES E. BUCK, M.D., BOSTON, MASS.

THE progress of medical science during the last half century has brought us into newer and closer relations with almost all other departments of physical science, but with none, however, in so intimate and indissoluble a manner as with that of electricity. Hence it has come to pass, says De la Rive, that the study of electricity, as it relates particularly to medical knowledge and practice, has become an absolutely indispensable study for everyone who practices, teaches, or in any way cultivates science, and wishes to be booked-up to the age and day in which he lives. Electricity and vitality are now known to be intimately related. It is an acknowledged fact that medical men are not as familiar with the links of this relationship as they, even, should be. Electricity in its different forms and manifestations is as absolutely and minutely concerned, according to their respective "laws of action," — in every life, with health, growth, disease, and struggle for recovery from disease, and in death, — as in the greater and mightier forces of gravitation and planetary revolution. Vitality is more than electricity. Life is electro-chemistry vitalized, and no person can possibly study this subject, which holds such powerful influence over health and disease, without the profoundest interest and substantial improvement. Physicians, of all men, should be frank with each other. More than other men we are dependent on each other for facts from which, when sufficiently numerous, we must reason up to generalization and then slowly discover and establish the laws of nature, as a rule of ethics, to comprehend life, disease, and death.

Isolated phenomena or experiments, nay even life-long experiments in medicine, are worse than unavailing, so far as they affect knowledge and improvement, if they are pursued only by a dogmatic routine, or in support of a foregone conclusion.

We must hold that the uncompromising lessons of careful and practical induction should attend every step, for no conclusion has ever stood the test of time and gained general consent with the intelligent that is not wholly and strictly in harmony with the laws of nature and with the moral laws of God.

The writer pleads the simple privilege of an investigator who, after careful research, has become thoroughly convinced that this subtle and all-pervading force of nature does exercise a powerful influence over the functions of the body. Without it in normal quantities and qualities we cannot enjoy good health. In fact, in the opinion of many of our best thinkers, our measure of health depends directly or indirectly upon the

condition of the magneto-electric influences that play such a prominent part in the functional activity of our bodies.

That we do not stand alone in this belief, we take pleasure in sub-joining some opinions of very conservative men who have devoted their lives to research work along these lines, and whose opinions are like golden warp in the tapestry of medical knowledge:

DR. ALFRED G. GARRATT, fellow of the Massachusetts Medical Society, says:

"It has repeatedly and conclusively been shown that nerves, muscles, and many of the secretions can be more surely and more uniformly called into their natural action by the means of electricity than by any other known agent, and the degree and kind of effect is widely different according to the form, quality, or intensity of the electricity employed, and the method of administering it at each seance."

DR. DUCHENNE, the eminent French specialist, in "Localized Electrification," says:

"It is assuredly incontestible that static electricity, which for so many years has been used exclusively in medical practice, has accomplished cures bordering on the marvelous. It has cured a large number of nervous and paralytic affections."

DR. TRIPIER, another French authority, in "Manual of Electrotherapy," says:

"Static electricity offers resources too much neglected in our day. There is in it that which cannot be supplied by any equivalent procedure in therapeutics."

DR. S. H. MONELL, an undisputed authority in New York, writes in the *New York Medical Journal*:

"Considered from every standpoint, a successfully operated and powerful static machine is without doubt the most surprising single therapeutic weapon in the whole arsenal of scientific medicine."

In "Well's Electrotherapy," we find these words:

"There is no pathological condition that cannot be satisfactorily treated by electricity; and in many cases preferably to any other therapeutic agent."

In an authoritative work on "Skin Diseases," the author, DR. P. S. HAYES, says:

"In this agent we possess one of the greatest stimulants to the metabolism. Without doubt static electricity is the ideal cutaneous stimulant."

In the official reports of Guy Hospital, New York, DR. H. M. HUGHES writes:



"When the body has been wasting, and the mind apparently giving way, and disease proceeding unchecked, if not increasing, notwithstanding a variety of remedies employed assiduously and for a long time, electricity has, under my own observation and direction, effected a really marvelous change."

In the *Medical Record* we find these words from the pen of Dr. W. J. MORTON, than whom no better authority exists in New York. He writes:

"The therapeutic use of static electricity has extended enormously in medical practice. I believe that no form of electricity penetrates more deeply than static; and premising a powerful machine, a powerful spark, a conservative expectation as to results, a fair amount of skill in administering, I believe that no other form of therapeutic energy equals its curative effect."

Another authority appears in the Guy Hospital reports, and in this instance Dr. WILLIAM GULL writes:

"The remarkable and in some instances astonishing results obtained by electricity in chorea and other nervous affections would seem to warrant the assumption of some direct controlling power in the electrical force over the nervous system. It is in hemiplegia and paraplegia, depending upon the direct influence of cold or arising from atony and hysteria, that electricity is of the greatest value. In these cases it is inestimable."

There is no more conscientious investigator in the electro-therapeutic field than Dr. W. Benham Snow, of New York.

From an interesting paper of his in *The Office Practitioner*, we quote:

"For the relief of chronic inflammatory conditions with associated stasis, physical measures, particularly static currents, mechanical vibration, and light, are generally indicated. And in acute inflammatory conditions, when properly administered, they are a great boon to suffering humanity."

The physician-in-chief to the Jewish Hospital for Deformities and Joint Diseases, New York, Dr. HENRY W. FRAUENTHAL, expressed this opinion:

"I think that there is a concurrence of opinion as to the value of electricity to alleviate pain, to aid in the absorption of pathological material, and to expedite the return of joints to their normal functions; that the results are quicker and better than those heretofore obtained by other methods."

The most wideawake electro-therapist in the West, Dr. OTTO JUETTNER, in an exhaustive article in the *Advanced Therapeutics*, writes as follows:

"In the treatment of manifold effects of gastric affections, electricity is of greatest clinical value. The general application of electric currents

have a most decidedly salutary effect on metabolism, and indirectly on the assimilative power of the stomach."

From another article in the same publication, we quote an equally good authority, DR. W. R. RUSHIN, who writes:

"My experience with the use of mechanical vibration, combined with light and radiant heat, from a high power incandescent lamp, is followed by excellent results. In cases of dysmenorrhea, sciatica, inflammatory rheumatism, stiff-neck, and rigid and sore lumbar muscles, by older methods it usually took from three to fifteen treatments to give relief and bring about resorption of the exudates causing the pain. Now one to five applications does the work, giving complete relief from pain after the first treatment. As an adjunct to the medical treatment of diseased conditions I find the method invaluable."

From an excellent paper, read before the members of the American Electro-therapeutic Association, at a recent meeting, we quote Dr. H. H. ROBERTS, another high-grade man in this line:

"Electro-therapy is not a cure-all or "panacea" for all the ills to which the human body is heir, but in many of the acute and especially the chronic cases more good can be accomplished by the judicious use of electric currents than any other known therapeutic agent."

WILLIAM WHITE, M.D., a fellow of the New York Medical Society, and professor of electro-therapeutics in the College for Women in New York, writes:

"Every kind of action, whether chemical, mental, or mechanical, is, philosophically speaking, electric in nature; and we are warranted in affirming that every atom, cell, and organ in our body has a positive and negative polarity, its acids and alkalies, and is in itself a miniature galvanic battery, each pole of which is as sensitive to influences of an opposite polarity as is the needle of a mariner's compass."

From the foregoing opinions that have appeared from time to time in the scientific press, it will be seen that physical remedial measures, with or without drug therapy, are gaining just recognition by the leading medical minds of the day.

Such treatment is not new; it is simply coming back to us in humble renaissance from the old masters who gave it the seal of their approval hundreds of years ago.

The only condition necessary to the successful use of these agents, is that the operator shall be thoroughly familiar with the modality that he is using, and have a very clear idea of the pathological conditions that he is treating, as well as definite knowledge of the results that he may reasonably expect to obtain in these treatments.

Such conditions come only with experience gained in handling many cases, not all in one line, but such a variety as the general practitioner would be called upon to treat.

## THE LEUCODESCENT THERAPEUTIC LAMP.\*

BY LAMSON ALLEN, M.D., WORCESTER, MASS.

THE therapeutics of light is just now occupying a vast share of our professional thought and research. As yet, we know comparatively little of its real worth. It is only in its infancy as regards accurate knowledge and definite results. Recent developments point to a much wider use of light, and of various forms of artificial light, in the treatment of local, nutritional, and constitutional disorders.

While the treatment of disease is important, its prevention is even more so, and the measures that best assist recovery will, if applied properly, in time best strengthen the organism to resist morbid influences. Modern science goes further, and, having discovered the exciting causes of many special diseases and disorders, as well as the manner of their transmission and propagation, enables us to attempt the prevention of such diseases by the destruction or prevention of agents of infection.

The practical use we can make of artificial light is for the prevention of disease as well as for their cure. This is especially true of one form of light as exemplified in the use of the leucodescent therapeutic lamp. And let me say here that all of light therapeutics is not contained in the Roentgen or Finsen ray. I have been using daily the leucodescent therapeutic lamp since August 22, 1905, and have found such help from it that I think the profession ought to know of it.

I have found it especially valuable in cases where we are sure of the work of ptomaines or bacteria. Moreover, the tonic effect of the light is well illustrated by its action on cases of neurasthenia and indolent ulcer. The following cases will show its scope and curative value:

CASE I. Mr. G., age twenty-two years, came August 23, 1905. In June last, while moving, in lifting furniture and hanging pictures, he strained himself, and in a few days an abscess appeared in the right groin, which later burrowed to the bottom of the right testicle. There it gathered and broke, causing two swellings, one in the scrotum, whence came the pus outside, and the other in the epididymis. The former was the size of an English walnut and the latter of a goose egg. To-day [August 23, 1905] a most estimable surgeon of this city advised the patient to go to the hospital and possibly part with this testicle. The organ was so sore and painful that he was confined to the house and part of the time to the bed. He began treatment on above date and continued at intervals up to March 28, 1906, when I dismissed him cured and testicle saved.

CASE II. Mrs. P., came September 19, 1905. Occipital headache for many years without known cause. Has consulted many physicians. Mother of one child, not living. There is no scar tissue in cervix uteri or

\* North American Journal of Homœopathy.

perineum. Two sisters, her mother, and grandmother each had and now have the same trouble. We will call it neuralgia by exclusion. To ride in electric or steam cars or to do shopping is sure to bring on a severe attack. First treatment with the lamp to occiput and spine greatly relieved; second treatment stopped all pain. She took ten treatments in all and has been well ever since. This illustrates the tonic effect of the light on the nervous system.

CASE III. Miss C. C., nurse, came September 26, 1905. Indolent ulcer on left leg of two years' standing. Leg, ankle, and foot greatly swollen, with great soreness and stinging pain. Second treatment with the leucodescent therapeutic lamp took out all pain and soreness and greatly reduced the swelling. New granulations showed on edges and margins at the beginning of third treatment. She came every second or third day. Dismissed after thirteen treatments, October 30, 1905.

CASE IV. Master R. M., aged fourteen years, came October 3, 1905. Acute yellow jaundice. Been ill four weeks and last two weeks very yellow all over body. Under care of a most reputable physician for past two weeks. Applied leucodescent therapeutic lamp over chest, liver, and abdomen, anterior and posterior, for twenty minutes. Next day better by fifty per cent, so that friends noticed it. Cured absolutely by five treatments on five successive days.

CASE V. Mrs. E. P. O., came October 7, 1905. For eighteen years has been suffering more or less with pain in right side of abdomen at McBurney's point. It has been diagnosed as recurrent appendicitis by five different surgeons, and following each attack she has been advised to go to the hospital and have the appendix removed. Twelve years ago she had the left ovary removed for cystic degeneration. Since then she has had three attacks of gallstone colic. On examination I found great sensitiveness over McBurney's point, tender over gall bladder, sensitiveness of right ovary to touch externally and from bi-manual examination, a great deal of pain running from the small of the back over crest of right ileum, as well as pain under both shoulder blades, more under the right. Patient remained in the city three and one-half weeks, during two and one half of which she took two treatments per day and the last week one treatment per day. At the end of this time she returned to her home (in New Hampshire) absolutely cured, and gained 7 lbs. in weight. To-day, June 6, 1906, patient is and has been perfectly well.

CASE VI. Mr. C. M. P., aged eighty years, came to my office October 9, 1905. For twenty-seven years had a scab on nose which would grow black, dry up, drop off, and re-form again. Within three weeks it has become very tender and irritable. Three weeks' treatment with the lamp cured it and the skin is now smooth and clean.

CASE VII. Mr. M. C. F., October 9, 1905, is a carpenter. On going

into a dark cellar he tripped and fell, striking his right knee on sharp stone. He tried to work for two days afterward, when the knee became greatly swollen and painful. He remained in bed five days, with no improvement, when I was called to the house on above date. He was brought to my office and three applications of the lamp, of thirty minutes each, took away all pain and soreness and reduced the swelling, so that he was back to work again in one week.

CASE VIII. Mrs. W. H., came October 27, 1905. Chronic bronchitis, with threatened consumption last spring, when Dr. H. C. Clapp, of Boston, Mass., made the diagnosis. Irritable heart, with palpitation. Eight leucodescent treatments have restored her to perfect health.

CASE IX. Mrs. A. C. H., December 30, 1905. Multiple cystic fibroid tumor of uterus, undergoing cancerous degeneration. For the past two years has been a great sufferer from uterine hemorrhages. As recently as last August and September she went nine consecutive weeks with continuous flowing, so that her physician and friends despaired of her life. She has had other spells of five to seven weeks of continuous and excessive flowing. When she came to me she was anemic, thin in flesh, very weak, and had to be led by two assistants. On a thorough bi-manual examination I found the abdomen distended with gas; there were three nodules found on palpation through the abdominal wall, and one lying over against the rectum and into the posterior cul-de-sac; the uterus itself was larger than a child's head at full term. For five successive days the patient came with two assistants; then for the three succeeding weeks with one. After that she came alone. On April 1, 1906, she dismissed her house-girl and is doing her work alone, excepting the washing. Now all the nodules that were apparent through the abdominal wall have disappeared, and the only one left is that in the posterior cul-de-sac which is now the size of a tangerine orange. She is no longer anemic, has gained in weight and strength, has no hemorrhages, and while not yet dismissed as cured, is well on the road to a perfect recovery, which I expect in less than three months. I have reported this case because of her remarkable improvement under such desperate conditions as existed on her first appearance.

CASE X. Mrs. Ed. D., came January 5, 1906. Tuberculosis of both lungs, with city hospital record. Temperature at 2 P.M., 101.5 degrees; respiration, 28; pulse, 100. Examination with the stethoscope and percussion showed serious lesions in right lung and beginning in apex in left lung. She came daily for treatments and I dismissed her April 1, 1906.

CASE XI. H. F. L., came January 12, 1906. Machinist by trade. Tuberculosis of right lung. Came directly to my office from city hospital. Examination showed lesions in apex of right lung. Temperature, 104.5

degrees; respiration, 30; pulse, 110. Nervous temperament; very weak; patient came for treatment every day and I dismissed him cured March 1, 1906. He is now working daily as a painter.

CASE XII. Mr. J. G. L., came February 19, 1906. An anomalous case of multiple fistulæ about the testicles, running down on to the buttocks of both limbs, probably from an old tubercular cystitis. There were eighteen openings exuding from  $\frac{1}{2}$  to  $1\frac{1}{2}$  pts. of pus in twenty-four hours. Night and day he was obliged to pass urine every one or two hours. He went in the spring of 1905 to one of our hospitals and was operated on without any results, unless it was for the worse. He was rapidly losing flesh and strength. I could promise him nothing, but suggested that he take at least twenty treatments, and by that time I thought we could see whether or not there would be any improvement, and if not, we would not continue them. By the eighth treatment he was so much improved that he would not discontinue the treatments under any consideration. By May 1, 1906, all pus had ceased exuding, all fistulæ had closed and smoothed down, all inflammation and soreness had departed, and I was about to dismiss him, when he carelessly got wet in a cold rainstorm and a phimosis appeared. That has not disappeared and some pus and soreness in some of the old fistulæ have reappeared, but are rapidly healing again. I report this case here to illustrate anew the bacteriological and germicidal power of the leucodescent therapeutic lamp.

I need not report further, only to say that I have on hand other equally interesting cases that I believe will ultimately reach recovery. I am treating cases of cancer of the breast and uterus with varying results and great improvement in all. I am sure that other physicians who are using the leucodescent therapeutic lamp in different portions of our country can corroborate my results. I hope we may hear from them through our medical journals.

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“ God gives each man one life, like a lamp, then gives  
That lamp due measure of oil; lamp lighted, hold high, wave wide  
Its comfort for others to share.” — *Robert Browning.*

“ ‘ HEIGHO! ’ yawned one day King Francis.  
Distance all value enhances!  
When a man’s busy, why, leisure  
Strikes him as a wonderful pleasure;  
Faith! and at leisure once is he,  
Straightway he wants to be busy.”

— *Robert Browning.*

# DEPARTMENT OF DIETETICS

## ALCOHOLIC BEVERAGES.

BY NATHAN S. DAVIS, JR., A.M., M.D., CHICAGO, ILL.

(Concluded from page 122.)

NOR does alcohol increase *muscular energy*. Experiments with the ergograph and with the dynamometer, as well as the cruder ones that have been so frequently repeated, of having the same work done by two sets of men, alcohol being given to one set only,—all demonstrate that more muscular work can be done without it than with it. After a dose of alcohol a man feels that he can lift a great weight, or in other ways exhibit unusual strength, and is surprised to find that he cannot. The subjective error is due to the same interference with the perceptive faculties that permits after-dinner trivialities to pass as weighty utterances. *Fatigue* is hastened, not delayed, by it.

As alcohol does not modify proteid metabolism, it will not materially change the output of *urea*. Experiments upon this point are conflicting. H. C. Wood, however, believes that a lessening in the products of tissue waste is effected by it. In fevers the albuminoids of the body suffer greatly and they are not proportionally, if at all, protected, by alcohol, as fats and, to a limited extent, as carbohydrates are said to be. If alcohol is not taken in sufficient quantity to produce intoxication, only a very small percentage will escape from the body unchanged; but if enough is taken to intoxicate, ten per cent or more may do so.

Under the influence of full doses of alcohol the *vessels of the brain*, like those of the skin, become greatly relaxed and filled with blood. When this change is first produced, the mind seems invigorated. It is generally asserted that mental work is for a time more easily accomplished. This is doubtful. All parts of the brain are not affected with equal quickness or by the same doses. The *brain-cells are poisoned* or partly paralyzed, the higher ones before the lower. The portion of the brain that is most influenced by external inhibitants or that itself restrains the other portions is first affected. So soon as the normal restraints are lessened, one becomes garrulous, ready to say and do things that otherwise he would not do or say. The effects thus produced may easily deceive and lead one to think that the mind has been stimulated, when it has only been unchecked. It has been shown that continuous mental work of a high grade cannot be done as well with alcohol as without its influence. Activity of neurons may multiply the trains of association and quicken the succession of

images, but the weakening of inhibition prevents concentrated choice. Thus judgment is affected early, while imagination may be left untrammelled. The emotions may be more than usually active. The drinker is easily made combative, affectionate, lachrymose. Moral perception is less keen in the habitual user of alcohol than in others. Mental diseases are also often due to it. The motor centers are also easily involved, sometimes even before judgment is materially affected. Speech is made thick, and later the movements of the extremities are unsteady or uncertain. Walking and other movements show imperfect muscular coördination.

It requires very large doses of alcohol to affect the *spinal cord*. When it is involved, the respiratory center is paralyzed before the heart is. The *vaso-motor* center is, however, early involved. The various portions of the central nervous system are affected in the same order as when ether is administered. They may all be overwhelmed, producing stupor or even death.

Quantities of alcohol not sufficient at any one time to produce intoxication or outwardly visible effects will, if their drinking be *habitually repeated*, seriously injure the tissues by interfering with oxidation. The brain and nervous system are especially likely to feel the effects. *Degenerative changes* are excited in these structures. In these, as in all tissues, even if alcohol enters them only in small amounts, yet is present constantly or with frequency, the chemical energy of the cells is diminished or changed. The disturbed metabolism of proteids increases or creates a tendency to attacks of gout or to the more chronic or obscure *lithemic* or *alloxuremic* disturbances. Sometimes the disturbing influence of alcohol upon carbohydrate decomposition and appropriation aids in the production of *diabetes*.

Although it is claimed that alcohol, when given in small doses, is not eliminated as such, it is well known that all inflammations of the urinary organs are aggravated by it. Those who have been steady, moderate, or heavy drinkers are especially prone to *renal diseases*. Two or three glasses daily of a beverage containing so small an amount of alcohol as is present in beer will cause casts to appear in the urine. The liver is also especially susceptible to disease when alcoholic drinks are used. The stronger beverages are most likely to affect it.

Individuals vary greatly in their *susceptibility* to alcohol. Some show ill effects from small doses, and others are seemingly resistant to large ones. Certain persons are stimulated by it to eat more heartily and to do less, and as oxidation goes on more slowly in these persons, they easily accumulate fat. Although plump, they are not resistant to disease, nor capable of prolonged hard work.

Because alcohol is an *antiseptic*, it has been tried as an internal antiseptic in infectious diseases. Experiments have shown, however, that alcohol given to animals lessens their power to resist inoculation with



numerous micro-organisms. When given in infectious diseases, no anti-septic influence has been demonstrable.

Alcohol is *unnecessary in health*, and those who have not strong self-control, or who inherit a love of liquor or a tendency to inebriety, to gout, to arteriosclerosis, or to other degenerative changes, are better off without it. Many individuals can use it in strict moderation without apparent harm. The majority sooner or later find that even with moderation they are not so well when they use it habitually, and they cease to drink it, or they take it more rarely. The abuse of alcoholic beverages is invariably harmful. The wisdom or unwisdom of the use of alcoholic beverages in health is not a question that the physiologist alone can determine. The ease with which the habit of using them grows to an excess and the injury done thereby to society make the desirability of their use a social problem as well as a physiologic one. This is not, however, the place to discuss the sociologic phase of the subject.

There are drugs that may be substituted for alcohol which are equally potent with the latter for the *treatment of the sick*. Its use is, therefore, not necessary either in health or in sickness. When prescribed in disease, it must be regarded as a medicine and not as something to be used at will by the patient. As the percentage in all beverages varies greatly, it would seem best, as urged especially by B. W. Richardson and by N. S. Davis, to prescribe pure alcohol diluted to the desired strength. Doses can then be regulated with the certainty deemed necessary when other medicines are given. It must be remembered, when in the following pages percentages of alcohol in various beverages are mentioned, that they are averages, the variation in different samples often being considerable.

*Alcoholic beverages* are generally classified as *fermented* or *distilled*. The former include wines and beers; the latter, spirits and liqueurs.

*Spirits* are made by fermenting various saccharine substances until as much alcohol as possible has been generated in them. From the mixture of sugar, ferments, water, and alcohol, the latter is distilled. When separated in this way alcohol can be made of various grades of strength and purity. The saccharine matters that are subjected to fermentation are derived commonly from barley, corn, rice, potato, sugar, and molasses.

The odor and flavor of each kind of spirit depend upon its source and upon different volatile ethers and by-products of fermentation that also pass through the still. Their medicinal action is that of alcohol.

*Whiskey* is defined by the United States Pharmacopeia as "an alcoholic liquid obtained by the distillation of the mash of fermented grain (usually mixtures of corn, wheat, and rye) and at least two years old." It has an alcoholic strength of from fifty to fifty-eight per cent by volume. It should be free from disagreeable odors. Its specific gravity should be between 0.93 and 0.917. When spirits of any kind are kept, the vola-

tile ethers and aldehydes that give flavor and character to them change and become more agreeable. For this reason distilled liquors are always ripened for a variable period of time.

*Brandy* of the standard of the United States Pharmacopica is "obtained by distillation of the fermented, unmodified juice of fresh grapes, and should be at least four years old." Its specific gravity is greater than that of whiskey, varying from 0.941 to 0.925. It contains from forty-six to fifty-five per cent by volume of alcohol. Brandy is kept for many years to ripen.

*Rum* is distilled from fermented molasses. It is often made by adding molasses caramel and various essences or flavorings to a solution of rectified spirit. It contains about the same percentage of alcohol that whiskey and brandy do.

*Gin* is distilled from a rye mash. It is flavored by juniper berries, which are put in the mash during distillation. It contains from fifteen to twenty per cent of alcohol, but is often strengthened by the addition of proof spirit, so that it contains from thirty to thirty-five per cent. Gin undergoes a double distillation and contains, therefore, less solid matter than the other forms of spirit. No gin contains so much as one per cent. There is no sugar in it and little acid.

*Liqueurs and bitters* are made from pure alcohol and various spirits and wines, by the addition of sugar, aromatic herbs, and essences. The following table compiled by Hutchison, will afford some idea of the composition of a few of those most commonly used:

	Alcohol.	Extract.	Cane Sugar.	Various Extractives.
Absinthe .....	58.93	0.18		0.32
Bénédictine .....	52.00	36.00	32.57	3.43
Crème de Menthe .....	48.00	28.28	27.63	0.65
Anisette .....	42.00	34.82	34.44	0.38
Chartreuse .....	43.18	36.11	34.37	1.76

*Beer or ale and stout or porter* are made by fermenting malt and hops. Malt is made by germinating moistened barley at a uniformly moderate temperature. During germination the starch of the grain is converted into dextrin and sugar. Malt, after it is dried and ground, is mixed with water to make a "mash," which in turn is heated to different degrees by different brewers. In this way the starch is more completely transformed into sugars and the latter are carried into solution. The action of the diastase of malt is arrested by boiling the wort, or filtrate, of the mash. Hops are boiled with it in order to extract some tannin, a bitter principle, and extractives. After the wort has been boiled it is rapidly cooled and finally fermented by the addition of yeast. To obtain a uniform product great care is taken that only a pure culture of yeast is used, and accidental infection of wort by other ferments is guarded against. Most of the yeast gradually rises to the top and can be skimmed off; some

settles to the bottom of the tank in which fermentation is carried on. The beer is drawn into casks, where fermentation to a limited extent continues. The yeast is finally completely precipitated, and the clear beer is bottled. If it stands long in casks the slight fermentation that goes on gradually increases the percentage of alcohol in it, making a "heavier" beer.

Beer and ales are described as "mild" or "bitter," according as they contain relatively much or little hops. The temperature at which malt is dried and mash is made also modifies the taste and character of the final product. Sugar and dextrins are important constituents of the fermented beverages.

Stout or porter is made as beer is, but the malt used in its brewing is first roasted, by which process some caramel is formed in it. This gives to the final product a dark color.

All these beverages contain from three to eight per cent of alcohol, from one half of one to nearly one per cent of sugar, from two to five per cent of dextrins, and possess a demonstrable acidity.

The acidity of beer will check starch digestion in the stomach. Its bitterness, however, increases the flow of saliva and the secretion of gastric juice. Beer delays the chemical process of *gastric digestion* more than the small amount of alcohol in it will account for. It increases and often creates abnormal acidity of the stomach and flatulence. Beer and stout are especially likely to produce *obesity*. Their use predisposes the drinker to *gout* and *lithemic* affections. They cannot be used by *diabetics* because of the carbohydrates which they contain. They also aggravate *renal inflammation*, *cystitis*, and *urethritis*. They are frequently drunk in quantities sufficient to distend the stomach even to a pathologic extent. Many persons feel somnolent after drinking beer, wherefore it is frequently taken at night as a mild soporific.

*Wine* is fermented grape-juice. The quality of wine depends upon many conditions. Some of these are: the variety of grape used, the soil and climate in which it is grown, its culture, and the character of the ferment that is employed in the manufacture of the wine. In recent times bacteriology has solved many of the problems with which wine-makers were formerly struggling. Pure cultures of various yeasts are used, and sometimes combinations of them, in order to produce the flavors that are sought for in wines. The sugar in grape-juice is more or less completely decomposed by fermentation, producing thereby varying amounts of alcohol. Its more or less complete fermentation depends in part on the amount of albuminous matter in the grape-juice. The yeast lives upon the albumin, but during its growth breaks up the sugar. If a given grape-juice is rich in albuminous matter, all the sugar may be fermented, and a "dry" or sour wine may be the result. If it contains little, the wine will be sweet. The character of wine is often modified by the addition of alcohol or sugar.

Natural wine cannot contain more than from fifteen to sixteen per cent of alcohol, as yeast-cells are paralyzed by it when this percentage is reached. "Fortifying," or adding alcohol to wine, is a common practice. It is done both to flavor it and to prevent all further fermentation in it. Sherries are always fortified; so are most champagnes, especially the sweeter ones.

The details of wine-making vary greatly and cannot be described here. The character of individual wines depends much upon the methods employed in their manufacture. Some are made from the juice squeezed from the grapes under high pressure; others are made by fermenting the juice with more or less of the skins and seeds in it. To some grapes, lime is added when they are crushed. So much to illustrate the very numerous modifications that are adopted by wine-makers in the production of this beverage. The most important *ingredients* of wine are water, alcohol, acids, sugar, ethers, extractives, and glycerin.

Wine contains several *alcohols*. Ethyl is the one that occurs in the largest amount; amyl, propyl, butyl, and others are developed in it in smaller quantities. A wine containing more than fifteen per cent of alcohol is fortified.

The most important of the vinous *acids* are tartaric and tannic. A number of others are sometimes present. Acetic acid is not uncommon. The total amount of acid varies, but is often considerable.

*Sugar* occurs in wine in too small a quantity to be of much value as a food. The sweet wines contain about four per cent of sugar, and the sour ones one-half of one per cent, or thereabouts. If wine were taken in sufficient quantity to obtain from it more than one half or perhaps one third of an ounce of sugar, it would produce intoxication.

The *ethers* result from the action of alcohols and acids upon one another. The flavors of special kinds of wine depend largely on the character and relative percentage of the contained ethers. They are very numerous, but each one occurs in very small percentage in any given specimen of wine. The extractives are mostly such carbohydrates as pectins and gums. Glycerin is always present in wine, but in very small proportion.

The following table from Dupré's analyses will give some idea of the chemical composition of a few wines that may be regarded as types of larger groups:

Wine.	Absolute Alcohol.	Total Acid.	Sugar.	Dry Residue.	Ash.	Total Alcohol in Ethers.
Hock . . . . .	9.73	0.506	0.062	1.92	0.17	0.042
Claret . . . . .	9.68	0.599	0.243	2.12	0.21	0.038
Hungarian . .	10.16	0.694	0.077	1.90	0.18	0.046
Greek . . . . .	12.35	0.611	0.225	2.50	0.30	0.048
Sherry . . . . .	17.80	0.487	3.015	5.06	0.50	0.061
Madeira . . . .	17.82	0.680	1.850	4.44	0.37	0.096
Port . . . . .	18.11	0.434	2.540	5.34	0.23	0.053
Marsala . . . .	16.80	0.361	3.500	5.36	0.26	0.049

*Cider*, which is made from apples and pears, is very similar to wine. It contains from three to eight per cent of alcohol, from 0.2 to 0.6 per cent of sugar, and 0.1 to 0.6 per cent of acid. The chief acid present is malic.

*Sparkling wines and ciders* are bottled before fermentation is checked, and filled with carbonic acid gas by its continuance. When uncorked, the gas escapes in bubbles. This is called "natural sparkling." Artificial sparkling is produced by forcing carbonic acid gas into wine, as into soda water. Effervescence adds to the attractiveness of wine, modifies its taste, and is said to hasten the absorption of alcohol from the stomach.

*Wines check the chemical processes of digestion* more than can be accounted for by the alcohol they contain. One per cent of sherry will stop salivary, gastric, and pancreatic digestion. It is probable that the acids in wines, and possibly also some of the ethers, increase the inhibiting influence of alcohol over digestion. Sherry and port are more active in delaying digestion than claret, and much more so than champagne. Although they exert this deleterious influence upon the chemical processes of digestion, even when they are taken in small quantities, they often improve appetite and stimulate more vigorous gastric peristalsis. Large amounts lessen nervous and muscular excitability.

A person leading a sedentary life cannot, with safety, take as much wine as one who is doing hard muscular work. Accepting as a just estimate the statement upon an earlier page that two ounces of alcohol is the limit permissible in health, one bottle of claret that contains approximately this amount is all that should be taken in a day, and not to exceed half of this amount of the stronger "fortified" wines, such as sherry. Taking different kinds of alcoholic beverages at a time, or even during one day, interferes with digestion more than the drinking of one kind does. Wines are used in health chiefly because their flavor is agreeable, and their milder effects upon the nervous system, such as lessening sensibility to worries and nervous tension, are grateful.

Their habitual use often produces *sour stomach*. Sometimes their excessive use causes *gastritis*. When those who are disposed, to *lithemia*, *gout*, or *rheumatism* drink wine habitually, and sometimes even when they drink it only occasionally, they become especially liable to outbreaks of these maladies. It is not probable that the alcohol in the wine is the only or the chief cause of this. The acids and the sugars in it must also be blamed. For although the organic acids form in the blood alkaline salts which theoretically should do good, especially in cases of uric acid calculi, it is probable that the presence of acid wines commingled with food, and especially with sugar and starch, *delays digestion*, and permits the occurrence in the contents of the stomach of changes that produce the chief toxic principles. The ill effects of these beverages are usually not felt by persons of the class under consideration immediately after drinking, but in from twelve to forty-eight hours later.

# EDITORIALS

## Journal of Therapeutics and Dietetics

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PITTS EDWIN HOWES, M.D., *EDITOR.*

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### THERAPEUTIC OPTIMISM.

THE careful reader of medical journal literature must admit that the trend of medical thought is swaying toward the usefulness of drug therapy.

The theory of the uselessness of drugs in combating disease is being more and more controverted in many quarters. In its place there is the tendency to study more closely those agents which, in days gone by, were given with such implicit confidence.

The reign of drug therapy is once more on the ascending plane of medical thought and action. In order that it should attain and hold its rightful position we must cast aside all of the old dogmas that prevented advance in times past. We must realize that we are not to combat a name; that under each name, or diagnosis, if you choose to call it, are gathered together many conflicting conditions; that almost invariably the various patients classified under one generic term may every one need something different from the rest to enable them to successfully contend with their departure from the normal or health, and regain what they have lost.

The term *diagnosis* should have two entirely different meanings for the accomplished drug therapist. The first is that, by connecting all the various symptoms into one harmonious whole, he is enabled to give a name, according to prescribed medical nomenclature, to the disease for the benefit of patients and friends. The second is that, by dissecting the various conditions which go to make up its entirety, he can intelligently treat them by the appropriate remedies. These two meanings should be clear-cut and entirely separated; not allowed in the slightest degree to invade the realm which belongs to each distinctively.

Much of the therapeutic nihilism is due to the fact that drugs have been said to be useful in certain diseases, without any distinctive reason why any particular one should be used in preference to the others. Such teaching could only result in an indiscriminate use of the drugs recommended with a very small chance of a successful outcome.

Therapeutic optimism must be brought about by a different line of tactics. Drugs must be more carefully studied, and their action in the various parts of the human economy more closely defined. The idea of prescribing at a name must be abandoned. We must desist from declaring that such and such drugs will cure such and such diseases, but must rather inculcate the thought that each patient is in a class by himself and must be so considered and treated.

#### THE SINGLE REMEDY AND THE STUDY OF DRUG ACTION.

ONLY by the use of the single remedy is it possible to study with any degree of success or satisfaction the action of remedies in general. Under the most favorable circumstances, with all the aids of chemistry, microscopy, bacteriology, laboratory research, and clinical experience, the problem is a sufficiently difficult one to determine the essential action of a drug when put into the human system in conditions of health and disease. Only by careful study and long-continued clinical experience at the best, can this question be settled. And this study and experience must be not that of one person but of many.

It is not enough that one physician should be able to obtain, or think that he obtains, results of a certain kind from the use of a given remedy; these results must be duplicated and confirmed by a multitude of others before the facts can be said to be established. This is indeed sufficiently difficult with a single remedy. Make it a combination, and the work is almost beyond human skill to accomplish. Every drug added to the original one is either inert and useless, or else it seriously complicates the question, and renders it so much the more difficult to answer.

Take a case of clinical experience. Consulted by a brother physician as to the proper blood remedies to be used in a case of boils, you speak of

the uses of calcium sulphide and echinacea in these conditions, and the indications for each. Anxious to get results, and not fully understanding the action of either drug, he goes home to his case, and gives the two remedies in combination. Suppose now that he gets the desired effects, and his patient is restored to health; what has the doctor gained, either for himself or for rational therapeutics? Only this, that the two remedies together produced or were followed by a certain result. Was the result due to the combined action of the two, or to that of the one or the other? If the latter, which one? Evidently he must either go on using both remedies in every similar case, or he must begin anew and try each one separately.

Or take the case of verbenin and solanine in epilepsy. The most probable supposition at present seems to be that these two are indicated in unlike, perhaps in opposite cases, the one being in a sense and to a degree complementary in its action to the other. Even this is simply supposition, a working theory on which to build until a better one is found. But what of the physician who undertakes to use them in combination for all classes of cases? What will he gain for his patients, and what will he add to the sum total of our knowledge of drug-action? If his patient is benefited, which drug was the effective agent? And is it probable that the union of the two will accomplish as much good as the indicated remedy given separately? But which is the indicated remedy, and how is he to determine what are the indications for either one, so long as he uses them together? What he needs is a definite indication for each drug, a special condition which it is calculated to relieve. In order to learn this, he or some one else for him must study first the single remedy. Later, if ever, may the indication for the combination be built up.

If a complex prescription be administered to a sick person, and recovery follows apparently as a result, who shall say which of the elements employed was the one which brought about the improvement? Or whether it might have been as the result of some new properties developed or intensified by the combination, as is found in the case of the hyoscine-morphine-cactin method of producing general anesthesia? Or if, instead of recovery, in some of these cases death is the result, who knows where to put the blame?

It is possible, of course, to study the effects of a compound in the same way as you would a simple, but even here the more satisfactory way is to study the action of the several elements primarily, and then to build up that of the combination. When the actions and uses of a few simple remedies have once been thoroughly demonstrated and are well understood, then the combination follows "as the night the day," and its action is as easily understood as that of a single remedy.

Beyond the single remedy and the few simple combinations, it is safer for most men not to go. I do not deny that there are some men who



can build up a complex prescription and have a reasonably correct idea of what it is to accomplish. I knew one such man, and I never knew another. He had such a thorough understanding of the actions and uses of drugs, and his grasp of the pathology and etiology of disease was so remarkable, that I could have trusted him to write any complex recipe, and know what results it would produce in any given case; and this I could have done if I myself had been the patient. But such men are rare, and you and I are not in their class.

With a good working knowledge of the basic indications for the various remedies, and the conditions to be overcome in any given case in order to its successful treatment, the physician is prepared to combine or alternate his drugs in such a way as best to carry out his object, the relief of the diseased condition. But this is a very different thing from beginning with a ready-made compound, or combining remedies whose action he does not understand, with the hope of hitting the mark with some one of the ingredients. There is neither science nor skill in the use of a shot-gun. All progress along the line of a better understanding of drug-action must come from the experimental and practical use of the single remedy.

J. M. F.

### BOOK REVIEWS.

ALL books reviewed in this department will be sent postpaid, upon the receipt of the quoted price. Send money order or bank check, making payable to Pitts Edwin Howes, treasurer.

*The Nursling. The Feeding and Hygiene of Premature and Full-Term Infants.* By Pierre Budin, professor of Obstetrics, University of Paris, director of the Clinique Tarnier, member of the Academy of Medicine; with introduction by Sir Alexander R. Simpson, M.D., LL.D., D.Sc., emeritus professor of Midwifery and Diseases of Women and Children, University of Edinburgh, and Walter Lester Carr, M.D., consulting physician to French Hospital, New York; member of American Pediatrics Society, member New York Academy of Medicine, etc. One hundred and eleven diagrams in color and other illustrations. Octavo, pp. 200. Cloth, price \$6.00 net. Imperial Publishing Company, 27 East 22d Street, New York City. The Caxton Publishing Company, London.

Occasionally we come across a book that seems to have an especial niche fitted for its reception, that has never been filled. Such a book is *The Nursling*, whose pages are devoted to the life-saving of the premature and full-term infants. Every practitioner who deals with this class of patients will be helped by its careful perusal.

*Healthology (Health Study)*. In Three Parts. Part I, Practical Dietetics, How, When and What to Eat; Part II, History of the Evolution of the Fasting Cure, Healthopathy; Part III, History of the Author's Thirty-one Days without Food. Half-tones of the author before, at different stages of, and after the fast. *Healthopathy (The Fasting Cure, Health Treatment)*. By Irving James Eales, M.D., D.D., Belleville, Ill., member of the American Association of Physio-Medical Physicians and Surgeons, The Illinois Physio-Medical Society, the American Osteopathic Association, the Illinois Osteopathic Association, etc. 12mo, pp. 211. Price, \$1.50 net. Published by the author.

All who are interested in the no-breakfast plan, and the fast cure should obtain and read this book. The author has set forth in an attractive manner the salient points of this new method of treating the abnormal conditions of the body. Not the least interesting is the description of the writer's experiment on himself.

*The Eclectic Practice of Medicine*. By Rolla L. Thomas, M.D., professor of the Principles and Practice of Medicine, in the Eclectic Medical Institute, Cincinnati, Ohio; ex-president of the National Eclectic Medical Association; consulting physician to the Seton Hospital. Illustrated with 2 lithographs in colors, 6 color prints, and 57 figures in black. Second edition. 8vo, 1033 pp. Price, cloth, \$6.00; sheep, \$7.00. The Scudder Brothers Company, publishers, No. 1009 Plum Street, Cincinnati, Ohio.

So much has been written, and justly so, in the praise of this book, that there is little to be said at this time except to emphasize the fact that a second edition has been demanded in a year's time. Good proof that its practical worth has been appreciated. Whoever has not a copy should hasten to add it to his working library and the investment will pay.

*Medical Diagnosis*. Clinical Methods for Practitioners and Students. Fifth edition, greatly enlarged and revised to date. By J. J. Graham Brown, M.D., F.R.C.P.E., F.R.S.E., assistant physician, Royal Infirmary of Edinburgh, and W. T. Ritchie, M.D., F.R.C.P.E., F.R.S.E., clinical assistant pathologist, Royal Infirmary of Edinburgh, with 200 illustrations and 8 full-page plates in black and white and in color. 12mo, pp. 508. Cloth, price, \$3.00 net. William Green & Sons, Edinburgh and London; Imperial Publishing Company, 27 East 22d Street, New York City.

Five editions of this work have been called for with gratifying rapidity, thus testifying in no unspeakable manner to its usefulness to the practicing physician. This last edition has been thoroughly revised and brought strictly up to date. Every reader can study its pages with profit.

# Journal of Therapeutics and Dietetics

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## STRONG NEED FOR THERAPEUTIC STUDY.

It is becoming more and more evident that those physicians who may be termed "therapeutic nihilists" are soon to become the minority to a very large degree.

Each month sees a greater number of medical men who believe in the efficacy of therapeutics to cure diseased conditions.

In a recent address delivered by George M. Gould, M.D., of Philadelphia,—the well-known writer, editor, and physician,—statements were made which all medical men would do well to study and remember. He said in part:

"A revival of faith in therapeutics is the one thing that can save the 'medical man'; unless it is had soon, there will not be enough faith left to act the part of the germinating seed.

"If you believe no disease preventable and curable, for man's sake get out of medicine and go into gambling, bucket shop, or politician's business. This sounds harsh; but is there not pure common sense at the bottom of it? Why claim to be a physician, a healer of the sick, and yet proclaim at the top of your voice that there is no virtue in medicine? Why visit the sick and the afflicted and charge for the service when you bring into the sickness nothing but the blackness of utter skepticism and charge for the stone you offer just as though it were wholesome, nourishing bread? Why claim to be a physician when you applaud with all your heart and voice the assertion that all there is to medicine, and the only basis upon which it may demand respect of the world at large, is its possible power to prevent disease, with the assurance that that time will come some day, but that in the mean time all we can do for those actually ill is to fold our hands and advise them to find their consolation for the agonies endured in the medical profession's honest belief that in the third or fourth or tenth generation from now such suffering shall be unknown? Much comfort in that to the sick, and small wonder that the people turn even to the ignoramus who has in his heart the faith that he can afford relief when it is needed!

We believe most thoroughly and emphatically in the usefulness of therapeutic measures to combat and eradicate diseased conditions. That the investigation and application of medicinal and mechanical therapy is the most important in which the medical practitioner can be engaged.

# DEPARTMENT OF THERAPEUTICS

## RUMEX CRISPUS

BY A. WALDO FORBUSH, M.D., SOMERVILLE, MASS. •

**RUMEX CRISPUS** — common name yellow dock — is a perennial plant growing in waste or cultivated soil, flowering in June and July. It possesses a slight odor and an astringent and somewhat bitter taste. It is soluble in alcohol and water, while the chemical constituents are chrysophanic acid, a peculiar gum substance, tannin — forming green deposits *with iron salts*, — starch, and an albuminous substance. The leaf-stalk contains quite one per cent of oxalic acid.

Rumex presents therapeutic characteristics not sufficiently appreciated by the profession in general. The cause, without doubt, lies in the deficient teaching of pharmacology and therapeutics in our medical schools. The spirit of present day pharmacology is faulty mainly because it oftentimes leads to discrediting that which practical experience speaks in favor of most strongly.

As we travel the paths of the so-called newer materia medica, with the craze for synthetical and toxine agents, would it not be wise to tarry and hold fast to the therapy proven good in the olden materia medica domain?

Professor James Burnett, of Edinburg, Scotland, very aptly remarked in a recent lecture to his class, that, "hundreds of medical men to-day are unable to prescribe simply because they neglected the study of their materia medica while students."

A knowledge of materia medica is important because the understanding of the subject is essential if we expect to get good results in our treatment of disease. After all it is the successful treatment with the sick patients and their friends. What do they care whether the doctor knows all about the hundred and one obscure things in medicine? He may know nothing about the latest investigation of the brain, or the newest facts about cancer, *but he must know how to get results from his treatment.*

Results are wanted; and unless you know how to treat those conditions which arise from deficient elimination of waste-products, or from any one of the several perversions of metabolic activity, you certainly won't get results unless you understand, in part at least, your materia medica.

In our study of *rumex crispus* we find absolute evidence of its value readily established. Under the old classification rumex is placed as an alterative, tonic, mild astringent, detergent, and in large doses laxative.

Its iron — *organic iron* — influence is quite lost to sight. This remedy stands as a good representative of the iron holding plants, and as such invites our attention.

From a most exhaustive observation on the natural and cultivated growth of the plant, Messrs. A. Gilbert and P. Lereboullet say that rumex deserves to occupy a prominent place among the iron-holding plants. Its roots possess the property of absorbing the iron of the soil which they transform through nature's handiwork into organic iron in a loose combination with the tissues of the plant, being especially abundant in the combined layers of the root. Moreover, the amount of iron in the plant can be increased by augmenting the iron of the soil, as by watering the plant with a solution of iron carbonate. By such cultivation Mr. Saget informs us that the stem and leaves of the plant increased their iron content from 28 to 269 milligrams for every 100 grams of the drug substance; that the root increased its iron from 75 to 447 milligrams; that he increased the iron, as such, to  $1\frac{1}{2}$  grams for every 100 grams of the dry plant. In observations like this absolute value is established, especially so in the iron-holding principle.

At the present time iron therapy, for final requirements of red corpuscles, is based on the value and use of an iron compound which is identical in form with that existing in iron-holding articles of food — barley, spinach, and other iron-holding plants — namely, the organic iron.

Here the term "organic" allows a special significance. It does not refer to the combination or order to which the iron is attached, but rather to the lines of attachment, thus signifying there is something more in rumex quality not accounted for as the result of hematinic therapy — something beyond the demonstrated evidence of increased hemoglobin beside that which we usually get in iron compounds.

To my mind, we do secure in organic iron, as normal, actual and active value in influence, and useful for improving nutrition. Under specific use it will suffice to effect a restoration of the general well-being.

Metabolism is the process of assimilation and elimination of the products produced. When defective to a degree it may be named anemia, which is the foundation for pathological conditions. In all anemias we can expect the toxin influence to be either endogenous or exogenous origin. Assimilated iron, like the carbohydrates, is stored up in the body in the form of intermediary organic compounds.

As one progresses further in investigations he becomes more convinced that there are positive qualities which hitherto has attracted little attention.

That rumex is quickly assimilated is proven beyond a doubt. That rumex does influence metabolism for the better appears quite true when we consider the claim of its increasing both the red corpuscles and the hemoglobin, as well as strengthening the nutritive processes, which may be considered as a food result.

There is good reason to regard the metabolism of organic iron as having features in common with that of carbohydrates, and that iron, as named, is to be considered largely on lines from its food standpoint; that its administration, as a remedy, would be indicated in — as nearly as possible — the natural food form, since the nearer the exhibited iron is to the natural organic or food form, the greater the ease of assimilation and the less strain upon the processes by which it is converted.

Rumex greatly influences metabolism and seems to, on lines given, accomplish something more than the ordinary purveyor's iron preparation, with some positive qualities, viz.:— the effect upon the digestive function, increasing that function for the better, and its marked effect on general nutrition; also its tono-alterative influence, especially in general debility, and in not irritating the alimentary mucous membrane; it does not produce headache or constipation or injure the teeth. In fact does not produce any untoward symptoms.

The clinical relations of rumex may be studied in its adaptation to anemia and simple blood dyscrasia, accompanied by malnutrition and adynamia.

Rumex is closely allied therapeutically to the phosphate of iron. Why it should supersede the phosphate of iron is not clear, but it certainly does prove in many instances superior; and, like the phosphate of iron, is often assisted in its therapeutic action by quinia and strychnia.

Under specific uses rumex will be found useful in many conditions for which iron is so frequently prescribed. When you consider what a small per cent of the ordinary iron preparation is kindly absorbed, and that the process, at times, severely taxes the digestive and eliminative function, and then remember that quite every part of the so-called organic iron is utilized at no appreciable effort to the stomach, liver, and kidneys, you can realize more fully the advantages of this natural preparation, in simple and secondary anemia, over hitherto methods of iron administration.

The employment of rumex is emphatically advantageous in the treatment of anemias of early life, the sequels of those acute diseases common to this period. It is also of particular service in instances when the very young or aged are subjects of impoverished blood. Its influence is very marked in these cases. The increase in hemoglobin at once follows its use, the red cells multiply rapidly, thus showing it to be a valuable upbuilder in all the name implies. It can be given with impunity to the youngest infant, unlike the ordinary hematinics in this respect.

Messrs. A. Gilbert and P. Leraboullet, with cultivated ferruginously augmented rumex — used therapeutically — in the ailments of anemic patients obtained good results. They increased the dose daily until full toleration was reached which was shown by the head symptoms of iron. In chlorosis, in chloranemia of tuberculosis, and symptomatic anemias, they observed a general improvement of the patient's condition under this medication. It supplied in part, at least, the exhausted and enervated cells with iron

in a state of combination essentially the same as that naturally provided — an organic or physiological iron.

The action is, in a majority of instances, more prompt and favorable than that of the ordinary iron preparations, in that it combines corpuscle-increasing properties with those of a metabolic promoter and tissue vitalizer.

Rumex is peculiarly adapted to the form of anemia in which there is impaired digestion. It increases the appetite and the nutritive processes in addition to increasing both the red corpuscles and the hemoglobin. In the more severe forms of anemia in which arsenic is indicated, rumex arseniated will be found to possess active and actual value.

In melancholia dependent on brain anemia, with the diminished phosphorus — the constant constituent of the brain, greatest at the prime of life. In excessive activity of the mind, accompanied with the excretion of an undue amount of this brain tissue element, inevitably a diminution of the mental capacities ensues. In both these classes rumex is strongly indicated from its well-known upbuilding influence. It is a good helpmate to all the indicated remedies in the conditions named, viz.: phosphorus, avena sativa, hyoscyamus, pulsatilla, ignatia, arsenicum, aurum, gelsemium, etc.

In epilepsy rumex is valuable where there is anemia resulting from a prolonged use of the bromides. It is also useful in the treatment of anemia when associated with neurasthenia and rheumatism. Here it may be given for long periods without deleterious effects and is completely assimilated, as proven by the increase in hemoglobin, in clinical studies under drug indications. Theories may change from time to time, but clinical results remain steadfast.

The gastric conditions for which rumex has been suggested is one of atonic deviation which had its beginning in hyperstimulation, with symptoms of loss of appetite and sense of fullness after eating. It is also valuable in dyspeptic hunger when there is a sense of burning in the region of the stomach. Rumex is useful in ulcerative stomatitis.

Ellingwood says, "In ulceration of the stomach with great lack of tone, rumex combined with quercus has no equal."

Rumex is not appreciably affected by the hydrochloric acid of the gastric secretions.

Symptomatic manifestations of poisoning of the nerve centers by self-generated toxins is a distinctive call for rumex.

Hutchinson has stated, that "the more the morbid anemias are studied the more it will be found that toxins of some sort play a part in their causation. We may have it set up by bacteria kept and nursed in our own intestines; or we may have toxins which develop from the waste of our own tissue."

Here the administration of rumex, as elsewhere, stimulates nutrition, promotes metabolism and hastens the tissue interchange which constitutes

health. It operates kindly without excitement but is somewhat slow in its action. Medication should be kept up for a considerable time, more particularly in chronic cases.

In diarrhea and dysentery rumex is a remedy of very great value. It has cured exceedingly persistent cases of exhaustive morning diarrhea with the following symptoms, viz.: evacuations scanty, bloody, oftentimes offensive, colicky pains before and after stool, sinking at the stomach, fetid breath, sweat and urine; the discharges being very frequent between early morning and midday.

In the asthenic forms of intestinal wrongs, and in the diarrhea of phthisis, affects the bowels, sensibly reacting as a mild astringent not unlike rhubarb. It is especially serviceable in the dysentery of aged persons and has been used successfully in apparently hopeless cases.

In early congestive albuminuria this remedy will be found capable of repairing the mischief and restoring the apparatus to its normal action, restoring tonicity to the parenchyma of the kidneys and the uropoietic tubules. It likewise seems to exert a power on all neuroses.

The diuretic influence of rumex was recognized, in a general way, at a very early date in domestic practice.

The dose of rumex in cases mentioned may be represented by the following prescription:

R. Fld. Ext. Rumex ℥i — ℥ij,  
Glycerin  
Aqua a.a. ℥ij Mix  
Sig. ℥i three or more times a day.

This dose may be given in alternation or combination with any other equally indicated remedy.

In chronic "Bright's"—chronic interstitial nephritis, rumex covers the indication calling for the iron influence without the objectionable feature of locking up the secretions.

Rumex will be found valuable in those irregularities of menstrual function which are dependent on anemia of the ovaries, amenorrhea, or vicarious menstruation, etc., being particularly useful in cases of anemia occurring in the young female, especially at the age of puberty, when the nervous symptoms predominate—they are fractious and irritable and sleep does not seem to give the needed recuperation. Rumex here meets the general anemia, and when combined with the *special* indicated remedy—helonas, senecio, pulsatilla, avena, phosphorus, strychnia, quinia, or achillea—will produce happy results.

In the treatment of fetid, virulent leucorrhea, and when the menstrual discharge is very acid and offensive, rumex internally and locally will be



found useful. Give internally with any other indicated remedy. For the local application I would recommend the following

R. Fld. Ext. Rumex 3j to 3iv.  
 Fld. Ext. Baptisia tinct. 3j to 3iij.  
 Aqua Oij. Mix.

Sig. To be used as a douche at blood heat.

Doctor Rutherford says, "Rumex is a moderate hepatic stimulant in cases of torpidity associated with the depressed condition which tends to anemia."

Fyfe says, "Coughs accompanied by increased sensibility of the mucous membrane of the bronchi, trachia, or larynx; feeling of irritation behind the sternum, accompanied by a cough which is increased by cold air and at night, distinctly calls for the rumex."

Rumex is of great service when the throat is swollen, sensitive, and dark red, with little pain in proportion or else entire absence of pain. The nursing sore mouth and ulceration of the buccal mucous membrane both come under the domain of rumex influence.

From the earliest knowledge of rumex it has been associated with the chronic and intractable skin manifestations of eczema. Among the French school of dermatologists the rumex crispus has always enjoyed a high repute on account of its natural iron-giving qualities, and its marked diuretic and depurative alterative influence. It is largely given in union with the viola tricolor by the French school. In this constitutional wrong "Morrow" says, "the fundamental cause lies in a constitutional derangement or diathesis, hereditary or acquired, that is distinctly due to the retention and accumulation in the blood of an undue amount of a certain excrementitious substance;" hence the skin manifestation. Useful adjuncts to rumex in this skin condition are berberis aquifol., echinacea, arsenic, calcium sulph.

In our rumex study we have collected a number of trial cases. They will be omitted, for to my mind, this is an obsolete method for drug proving. In the confusion of the make up in cases we are apt to look more to the case as a whole and less to the specific drug characteristics which should predominate in drug study.

In selecting a preparation for therapeutic use buy only that preparation where the label shows the *precise per cent of iron content*.

Nearly every physician has found the judicious combining of strongly indicated remedies useful in many trying cases. For drug study the simple remedy for evidence of drug value may be advised. In the interests of our patient and self, when the indications of the case in hand points to two or three remedies covering the totality of symptoms, it is a duty to cover the complex symptoms presenting.

In this age of special therapy rumex will be equal to the occasion if a simple or a combination of indicated remedies are required.

**DOSE.** Unlike the average drug dose — where the maximum and minimum dose is stated — I would suggest the thought advanced by the French teachers, Messrs. Gilbert, Lereboullet, and Saget, of administering to each individual case their full toleration.

## A STUDY OF THE TWELVE TISSUE REMEDIES.

BY JOHN WILLIAM FYFF, M.D., SAUGATUCK, CONN.

THESE remedial agents should be carefully studied by our physicians with a view to obtaining more reliable specific indications for their employment than any which have heretofore been published. That they possess therapeutic power is a frequently demonstrated fact. A large part of the indications for them to be here presented for the consideration of the readers of this JOURNAL have been obtained from homeopathic sources, but so many of them have been found useful in my own practice that no hesitation is felt in commending them to the attention of all medical practitioners.

NO. 1. *CALCII FLUORIDUM* — *CALCAREA FLUORICA* — FLUORIDE OF LIME.

This agent is mineral fluorspar prepared by trituration with sugar of milk.

In diseases involving the substance forming the surface of bone, enamel of the teeth, and part of all elastic tissue, whether of the skin, the connective tissue, or the walls of the blood vessels, the fluoride of lime is likely to constitute a useful medicament. Having this knowledge of the salt in mind, it will be suggested as a possible remedial agent in all diseases which can be traced to relaxation of any of the elastic fibers, including dilatation of the blood vessels, arterial and venous blood tumors, varicose and enlarged veins, hard indurated glands, malnutrition of bones, pendulous abdomen and in some cases of uterine displacement.

In coughs characterized by tickling and irritation of the throat on lying down, caused by elongation of the uvula, or droppings at the back of the throat, *calcarea fluorica* is often a very useful remedy, and in stuffy colds in the head it exerts a corrective influence. In various forms of catarrh, especially when the expectoration consists chiefly of yellowish small lumps, it has been used with marked advantage, and when there are sparks before the eyes, spots on the cornea and induration in the eyelids it has been found useful. In conjunctivitis and enlargement of the meibomian glands this salt of calcium has also been found useful. In gouty enlargement of the finger joints its influence is unmistakably curative, and as a means of aiding dentition it is

often valuable. It is also an efficient remedy in the vomiting of infants during the period of dentition. Weak infants, having thin skulls and open fontanelles, under the influence of this agent have been greatly benefited, and knotty substances which are sometimes found in the female breast have been caused to disappear through its continued use.

In enlargement of the heart, with feeble action of the organ, *calcareo fluorica* has been employed with advantage, and in dilatation of blood vessels, it is a very useful drug. In varicose ulcers it aids much in the treatment, and in varicose veins about the vulva Dr. Porter has found it a very efficient remedial agent. He also employed it with excellent success in distention of the ovarian and subovarian plexus of veins.

*Calcareo fluorica* possesses the power of strengthening the elastic tissue of the gravid uterus, and thus causing parturition to become less painful. When after-pains are feeble and inefficient it increases and regulates contractions. It is also of value when there are excessive bearing-down pains and a tendency to flooding. In pelvic abscesses resulting from caries of bone, it has been used with beneficial effect, and when suppurative processes affect the bone it is a most useful remedial agent. It is also useful in old cases of fistulous sinuses of the mammary glands.

When there are symptoms of acidity *calcareo fluorica* is often very efficient as a means of removing long, round, or thread-worms. The drug is supposed to act by destroying the excess of lactic acid which seems to be necessary for the maintenance of the life of the worms.

In indurated lymph glands *calcareo fluorica* tones up the walls of the blood vessels and thus favors absorption, and when there are hard swellings in the soft tissues it acts in a curative direction. It is also a useful remedy in bony excrescences.

The following indications, taken from Fyfe's *Materia Medica*, suggest the lines along which this drug may be profitably studied: "Varicose and enlarged veins; blood tumors and piles; dilatation of blood vessels; malnutrition of bone, especially of the teeth; indurated glands of extreme hardness; hard lumps in the mammary glands; ulcers of the scalp with callous, hard edges; tumors of the eyelids; osseous growths; vascular tumors with dilated blood vessels; chronic synovitis; cystic tumors caused by strain of the elastic fibers; whitlow or felons; suppuration of bones; exudation from surface of bones which quickly hardens."

The medium dose of *calcareo fluorica* is five grains of the third trituration, but it may be prescribed as follows:  $\mathcal{R}$  *Calcareo fluorica*. 3x. gr. xx to  $\mathfrak{z}\text{i}$ , water,  $\mathfrak{z}\text{iv}$ ; teaspoonful every hour.

**CAPILLARY BRONCHITIS: ITS DRUG TREATMENT.**

By W. C. ABBOTT, M.D., CHICAGO, ILL.

WHEN inflammation of the respiratory mucosa has invaded the bronchioles, the gravity of the attack is so largely increased that the malady deserves a separate name and special consideration as to its treatment.

It is especially perilous at the extremes of life, and many an infant, many an aged man, have succumbed to its onslaught. In these cases it is particularly dangerous if the attendants be inexperienced and careless, for as respiration becomes more obstructed and carbonic acid poisoning supervenes, the patient grows quiet, the cough is less prominent, and only when the nurse has been warned is she likely to note the increasing shallowness of respiration and the cyanosis that is slowly deepening. Many a time the wearied mother has finally dropped to sleep, her apprehension relieved by the fact that the symptoms in her infant are subsiding, and has awakened in the morning to find the child's life has passed away. So also with the aged, the stuporous condition due to this cause is apt to end in death.

The possibility of capillary bronchitis occurring, either primarily or in the course of an ordinary bronchitis, should not be forgotten; the symptoms are so marked, so readily recognized, that only carelessness or absolute lack of experience would explain their being overlooked.

The older writers were accustomed to advise that, for children with bronchial catarrh, an emetic be administered previous to the family settling for the night. It is unlikely that sufficient mucus to determine a fatal result should collect during the few hours of sleep, but during the day and night, if measures are not taken to remove this collection of mucus, this may readily occur. Accordingly emetics of some description should be given at bedtime. Probably the best emetic is mustard water; or if this be not acceptable, then use one of the mineral emetics, such as copper sulphate or alum, the side-effects of these being rather to stimulate the mucus membrane than otherwise; whereas apomorphine inducing a freer outflow of mucus from the diseased tract may itself add to the danger. The same is true of emetine and of lobelin; in the latter the great depression following its full action depressing the child's vitality still further.

It is essential in these conditions to stimulate expectoration, and this is best done by the administration of sanguinarine. To an adult grain one sixty-seventh may be administered every half hour to one hour until the desired effect has been secured. This remedy increases the sensibility of the bronchial mucosa, and makes the patient cough more, thus ridding his respiratory tract of the accumulating secretions. This is especially valuable in the aged. The remedy may be given until slight nausea is manifested, or until the cough is stimulated to such a degree as to render it effective in raising

the mucus — this is better than to push the remedy to nausea. Another remedy acting somewhat similarly is the monobromide of camphor, which may be given to an adult in doses of one grain every hour. It is not as good a remedy, however, as sanguinarine.

In these cases as a rule it is advisable to watch the heart, and if any sign of coming debility appears, to administer digitalin enough to sustain it. There is a considerable misconception in regard to the dosage of digitalin. This remedy, which is really digitalein, is not nearly so powerful relatively as digitoxin, and the dose is very much larger. Ten years ago Dr. Beates surprised the profession by announcing that he administered digitalin in doses of one tenth to one fourth of a grain three times a day, and that he had given such doses for years, not only with impunity, but with the greatest advantage. Quite recently he has reiterated these views, but has considerably enlarged his dose, stating that now on occasions he gives doses of two grains of this water — soluble digitalin. We do not believe that it is often necessary to use such doses as this, but we would not hesitate to do so if the case required it. Physicians are far too much in the habit of giving the ordinary average dose when indicated; and if the desired results do not follow, they drop the medicine and “try” something else.

The effects of digitalin are so constant, so uniform, so certain, that if the indication really exists for its application, and the ordinary doses do not give the desired results, this simply signifies that the reaction of the patient against this medicine differs from that of other patients, and that the dose should be increased until the desired reaction is manifested. This is so simple a matter that it is difficult to see how it fails to be comprehended by so many otherwise excellent observers.

In many instances strychnine may be added with good effect; and this remedy also increases the sensibility of the respiratory mucosa. It is not wise to push strychnine too far, as under certain conditions large doses are followed by collapse. This is especially the case when individuals have been subjected to great fatigue with exposure to cold. Here the remedy is not strychnine, but caffeine. In capillary bronchitis it is rarely wise to give single doses of strychnine larger than one thirtieth of a grain, and never larger than one twentieth of a grain. Should more be required it is better to use one thirtieth of a grain or even one sixty-seventh, and give it more frequently, or in alternation with a heart tonic which acts in quite a different manner, such as caffeine. One sixty-seventh of a grain of strychnine alternated every hour with one grain of caffeine valerianate, midway between each two doses of strychnine, would seem to be the maximum of stimulant that could possibly be required in any case.

Another useful alternate is quinine, and since quinine is given as a tonic in such conditions the valerianate is the best of its salts.

I am confident that one sixth of a grain of quinine valerianate, given every

half hour, or even every quarter hour, will give a better effect in many of these cases than a much larger dose at less frequent intervals. One great advantage of these small, stimulating doses is that you can stop the drug at just the desirable point.

During the declining stages we need remedies that will promote the liquefaction and absorption of exudates as quickly as possible. By no means the least of dangers is that of leaving a chronic condition which offers a peculiarly suitable soil for the development of tuberculosis. The writer is strongly favorable to the administration of the biniodide of mercury throughout the affection, giving one sixty-seventh of a grain from four to seven times a day from the beginning. There is no possible harm that can be done by this remedy; it is an intestinal antiseptic of no mean value, and certainly favors the quick absorption of morbid deposits.

As the disease subsides calcerin may be added. This is an exceedingly active form of iodine, permitting absorption very rapidly; while the lime is in a condition for quick absorption and assimilation, and consequent utilization as a material for repair.

A very powerful absorbent combination consists of mercury biniodide one sixty-seventh of a grain, iodoform one sixth of a grain, arsenic iodide one sixty-seventh of a grain, and phytolaccin one sixth of a grain. This combination is better, the writer believes, than any one of the ingredients separately, each one synergizing the other. It may be given from three to seven times a day, carefully watching to avoid such doses as will cause salivation, which would be a disaster. It is a very safe remedy to use, because the arsenic and the iodines unite in causing irritation of the eyelids, a warning to suspend the remedy or to give it less frequently. If this is attended to there is no possibility of salivation resulting.

When debility is manifest, local and general, with feeble capillary circulation, eucalyptol is a useful remedy. This may be given in doses of one sixth to one grain, repeated every two hours. Here also the small frequent dose is preferable to large doses at greater intervals. This is useful to be given in connection with sanguinarine, when that is indicated.

If anemia is marked during the convalescence, iron arsenate may be added, in doses of one sixty-seventh of a grain every two hours; or quinine hydroferrocyanide if there be still a tendency to some fever, the dose of the latter being one sixth of a grain every two hours.

Although this article is upon the "drug treatment" of this disease, I cannot refrain from calling your attention to the great value of two non-drug remedies: One of these is counter-irritation: It is the writer's custom to envelop the chest in a plaster made by stirring mustard into boiling molasses,—a mussy thing, but the molasses keeps the mustard from burning unduly, and the mustard causes just enough burning to keep up redness. The constant derivation thereby induced is of the utmost value, and is worth all the trouble it causes.

The other is the inhalation of steam. The writer has used this in his practice for over thirty years, and it has never failed to prove of marked value in soothing and relieving the cough and helping to resolve the inflammation. I use it from the beginning, and as frequently as possible; keeping the room constantly moist by disengaged steam, and having the patient inhale the steam, drawing it by deep breaths "into the bottom of the lungs."

It is hardly worth while to medicate the steam. I have never been able to satisfy myself that any addition whatever increased its efficacy; and besides, the use of such remedies is apt to confuse the physician as to the value of the steam. However, if it is deemed advisable to impress upon the patient's mind the idea that there is something more than pure steam, a few drops of tincture of benzoin may be added, or even of tincture of iodine. Better than either of these, however, it would be to add a few drops of formalin, the fumes of which are so highly germicidal that the remedy is advisable in all cases of respiratory catarrh in which we presume micro-organisms to be at work.

Great care should be taken to supply the fullest ventilation, and yet to avoid exposing the patient to the danger of taking more cold from draughts. However, there is no "draught" so dangerous to a patient as the inhalation of his own exhalations over and over again.

The bowels must be kept free throughout. At the beginning one sixth of a grain of calomel and one twelfth of a grain of podophyllotoxin may be administered every hour for six doses, followed by a full dose of saline laxative. If greater derivation is required it is best obtained by throwing into the rectum or colon a half pint of cold saturated solution of table salt. The derivative effect of this remedy is remarkable.

Like apomorphine, pilocarpine is formally contraindicated in this malady. In some cases, even in the majority, a profuse sweating produced by pilocarpine may do a very great deal of good, even jugulating the attack if taken early enough. Nevertheless, the danger of causing pulmonary edema and hyperemia is such as should not be overlooked, since it possibly might prove fatal. For the same reason any endeavor to produce sweating by the free inhibition of fluids should be set aside. The use of liquids should be reduced to the lowest possible point, and derivation secured mainly by means of the exosmotic enemas mentioned.

If there is a harvest ahead, even a distant one, it is poor thrift to be stingy of your seedcorn.—*Thomas Carlyle*.

THE world looks dark. Shall men, therefore, be dark too? Is it not a manly business to bring it back to light and joy?—*Charles Kingsley*.

Men exist for the sake of one another. Teach them, then, or bear with them.—*Marcus Aurelius Antoninus*.

## DRUG STUDIES

### SOLANUM CAROLINENSE.

BY J. M. FRENCH, M.D., MILFORD, MASS.

**SOLANUM CAROLINENSE**, common names horse-nettle, bull-nettle, sand brier, treadsoft, and treadsaf, belonging to the natural order solanaceæ, is a perennial herbaceous plant, growing from eight inches to a foot and a half in height, and having a stem which is usually simple and erect, but sometimes prostrate and branching from the root, which is more or less contorted, and from one eighth to one fourth of an inch in diameter, with a thick bark surrounding a slender woody center, and running down deep into the soil. The leaves are oblong, alternate, ovate; the flowers occur in cymes or racemes, regular, with calyx five-parted, sepals pointed, stamens five, fruit ripening into an orange or lemon-colored berry from one half to three fourths of an inch in diameter. It is a common and abundant wild plant, growing freely in waste places and cultivated fields from Connecticut to Iowa, and southward to the Gulf of Mexico. All parts of the plant are used in medicine, but the fruit contains the largest amount of the active principles, and hence is the most active therapeutically, then the root, leaves, and stem in the order of their activity.

The essential therapeutic action of solanum is that of an antispasmodic, and it is used chiefly in convulsive disorders, such as chorea, puerperal eclampsia, infantile and hysterical convulsions, and epilepsy, especially that form in which the convulsions are severest or are brought on chiefly at the menstrual periods.

Ellingwood states that it was used in an eastern hospital for epileptics, experimentally, with the result that the number of convulsions was reduced twenty-five per cent. It may be given in all forms of epilepsy in sufficient dosage and frequency to produce a sensation of dullness and drowsiness. It has cured some stubborn cases and relieved many. Its specific field is yet to be determined. It has also been used in the treatment of puerperal convulsions with satisfactory results in a few cases. In hysterical convulsions it has been useful to some extent.

According to Thornton, in large doses it depresses the cerebrum and the respiration, stimulates the spinal cord, and does not affect the circulation. Napier considers that it is diuretic, anodyne, and antispasmodic, useful in various convulsive diseases and in tetanus. Pearce found it of special value in essential epilepsy, in most cases lessening the frequency and severity of the paroxysms.



Dr. M. Clayton Thrush, in the *Philadelphia Medical Journal* for May 3, 1902, makes a careful and somewhat extended report on the uses of this drug, especially in epilepsy. He treated a series of twenty-five cases of epilepsy with it in three Philadelphia hospitals, making use mainly of the fluid extract of the fruit and root. He presents the following conclusions:

“(1) It is of greatest value (probably better than any one known remedy) in grand mal of idiopathic type without hereditary taint, and where the disease has begun beyond the age of childhood.

“(2) It is perhaps next of greatest value in hystero-epilepsy with marked convulsive seizures. In cases of petit mal the drug does not seem to do the great good that we have noted in the major type of the disease.

“(3) In cases of well-advanced epilepsy of any type in which there is degeneration of the cerebral neuron, the drug will act specifically for a time, even better than the bromides, but it will finally be determined that the bromide salts will ultimately control the attacks better in these cases.

“(4) The foregoing clinical study has brought out sufficient clinical evidence to warrant the statement that the inherent advantage of vegetable depresso-motors is great as compared with any mineral salt given with the same intent, since destruction of the blood corpuscles by the latter is a most detrimental feature towards lessening the resistance of the individual in a disease where, above all, the constitutional tonicity should be favored as ideal treatment.

“(5) A thorough impregnation of the nerve cells can alone be had, and therefore cure hoped for in epilepsy, in proportion as solanum is pushed to the fullest physiological dosage, and maintained through periods of months, a year not being too short a time to warrant its discontinuance.

“(6) The fluid extract of the drug made freshly is the ideal form of pharmaceutical preparation given in ascending doses, commencing with one fluid dram and increasing to the full constitutional effect. It is to be preferred decidedly to the bromides in those cases where it can be used advantageously, because no toxic symptoms follow its free administration, and the mental faculties are not impaired by its use.”

Solanum is not official in the United States Pharmacopœia. There is, however, a fluid extract, the dose of which, according to Shoemaker, is from one to two drams four times a day. Merck gives the dose as 12 to 60 minims. The specific solanum of the eclectics, which is made from the root, is used in doses of from five to twenty minims. There is also a tincture made from the whole plant, the dose of which is from twenty to sixty minims.

The chief active constituent of solanum is the alkaloid solanine; it also contains a small proportion of solanidine, and according to some observers, solnine, and solanic acid. Solanine was formerly classed by some as a glucoside, by others as a glucosidal alkaloid. While it undoubtedly possesses glucosidal properties, in that it can be broken up into glucose bodies, yet the

fact that it combines with acids to form salts, renders it clearly an alkaloid. Solanine is also found in various other species of *Solanum*, as *Solanum dulcamera*, *ferox*, *lycopersicum*, and *nigrum*. As this is the principal alkaloid and most important active principle found in the entire group of *Solanaceæ*, it is worthy of careful study. It occurs in fine, silky needles, is colorless, insoluble in water, slightly soluble in ether and cold alcohol, quite soluble in hot alcohol. The hydrochloride of solanine is readily soluble in water.

Brunton says that solanine in warm-blooded animals paralyzes the central nervous system without affecting the peripheral nerves or the voluntary muscles. It slows the heart and respiration, lessens sensibility, and causes death by convulsions. The temperature constantly falls. The pupils remain unaffected. It produces weakness, labored breathing, nausea, vomiting, and drowsiness, but no true sleep. There is no increased action on the part of the bowels, kidneys, or skin. Other observers make similar statements, differing in some particulars, but on the whole, Brunton's resumé of the physiological action of solanine is the clearest, most concise, and comprehensive of any which I have been able to find.

The first evidence of the full therapeutic action of solanine, according to Waugh, seems to be *an acid burning in the throat*, and this is followed if the dose is increased by *oppression of the respiration*. These symptoms, therefore, should be taken as indications calling for either a reduction in quantity or frequency, or else the entire withdrawal of the drug.

Thrush tells us that "solanine has been used extensively by the negroes of the southern states in the treatment of epilepsy with excellent results, as has been confirmed by a number of observers. It has been used in hysterical convulsions with prompt results, also in a case of eclampsia, in which it controlled the convulsions after everything else had failed. It has proven valuable in Bright's disease when the kidneys were acting but slightly and the patient was taken with convulsions; it completely controlled the convulsions, besides being an anodyne and antispasmodic, also a valuable and active diuretic. It is efficient in controlling epileptic convulsions attending painful menstruation, also epileptic attacks associated with imperfect development, chorea, and puerperal eclampsia. It has been used with much success in pregnancy with convulsions due to albuminuria, also in uterine hemorrhage, and it acts as a powerful styptic in arresting hemorrhage.

*"In order to obtain satisfactory results the remedy must be carried to its full constitutional effect, which is indicated by drowsiness and stupor, and then reduce the dose."*

We have therefore two different statements of the symptoms calling for a reduction in the dose; the one, that of Waugh, gives the symptoms of drug sufficiency "an acid burning in the throat"; the other, that of Thrush, is the full physiological effect, "drowsiness and stupor." Beyond either of these points it should only be pushed with the utmost care.

Merck gives the dose of solanine as one sixth to one grain, several times daily, maximum dose, one and one half grain single, eight grains daily. Abbott directs, of the alkaloidal granules of one sixty-seventh grain, one to six every half to two hours until effect — “an acid burning in the throat.”

The writer asks the readers of the JOURNAL to test this remedy in their own practice and report their results to him. The drug is evidently indicated in convulsive disorders of various kinds. Let us join hands in the endeavor to find out more definitely than is now known the precise kind or kinds of convulsive disorders and the precise conditions of disease in general in which it is indicated. We have in solanum an agent capable of doing both good and harm. What we want to know is how to obtain the good results and avoid the bad ones. Send in your results and conclusions to the writer, and he will collate and arrange them, and present the summary in the form of a collective investigation report, giving due credit to all parties concerned. Please give especial attention to its use in epilepsy.

## THERAPEUTIC NUGGETS.

**ARSENICUM.** Many investigators of drugs have pointed out the value of arsenic in the treatment of tubercular disorders. The late Professor Howe used Fowler's solution and veratrum with great frequency in his treatment of phthisis. The arsenical preparation was used as follows:  $\mathcal{R}$  Fowler's solution  $\mathfrak{Jss}$ .; syrup lactophosphate of calcium  $\mathfrak{Jvj}$ . Sig. Dose,  $\mathfrak{Ji}$  three times a day every other day. Excellent results may be expected from arsenic in those cases of chronic gastritis, which are marked by burning sensations, and where the difficulty is due to cutaneous eruptive retrocessions. Here very minute doses must be administered. Among the specific indications for arsenic may be noted: skin muddy, dull, sallow, or pallid, and inelastic; pulse soft and easily compressed; extremities cold; periodicity not cured by quinine, tongue pale and expressionless.

**CARBONATE OF AMMONIUM:** This is one of the best remedies for your broken-down patients with lack of vitality, especially if the indications for an antacid are present. It should be used in doses of  $v$  grs., in a little sweetened water, as often as necessary.

**COMPOUND TINCTURE OF MYRRH.** This is a very powerful stimulant for which the following is the prescription:

$\mathcal{R}$  Myrrh,  $\mathfrak{Jij}$ .

Capsicum.  $\mathfrak{Jss}$ .

Dilute Alcohol.  $\mathcal{Oij}$ .

Mix

Sig.— Dose, from  $gtts.ij$  to  $\mathfrak{Ji}$ .

This will prove superior to the capsicum alone and may be resorted to in cramps in the bowels, in collapse from any source. It may also be used to arrest diarrhea.

**PHOSPHORUS.** This agent is a powerful general stimulant and tonic to the nervous system. You will get the best results from small doses. *Specific indications:* Vesical and prostatic irritation, with mucoid discharges, fulness or dragging in the perineum; enlarged and pendulous testes; chronic ovaritis and chronic vaginitis; pneumonia when pus appears in the sputa; cholera infantum, when there is nervous exhaustion, and the discharges from the bowels are slimy and frothy, with tympanitis; results of sexual abuses or excesses.— *Fyfe.* Dose, gtts.  $\frac{1}{4}$  to gtts. v.

**POLYMNIA UVEDALIA.**— This remedy exerts a special influence upon the diseased spleen. Among its indications may be noticed, enlargement of that organ with sensations of weight and dragging. It makes no difference whether the enlargement is due to malarial influence or not. Dose of the specific medicine gtts. 1—gtts. x. well diluted with water given hourly. An ointment, made by adding eight troy ounces of the fresh root cut in small pieces to sixteen troy ounces of lard or  $\frac{1}{2}$  mutton suet, and heating this mixture until all water has evaporated, and strained while hot, will prove an admirable adjunct for use externally, having it well rubbed and toasted into the enlarged organ.

**CIMICIFUGA RACEMOSA.** *Specific indications:* Muscular pains in the back, loins, and thighs; sense of soreness, with dragging pains in the uterus; deep-seated muscular pains, with hot skin and sweating; ovarian pains; dull, tensive intermittent pain, as if dependent upon a contracted state of muscular fiber; soreness of muscular tissue; slow, irregular, scanty, or protracted menstruation; dysmenorrhea, when evidence of a rheumatic diathesis is shown; afflictions incidental to pregnancy; chronic muscular rheumatism; soreness of the respiratory apparatus, giving a sensation of being bruised.— *Fyfe.*

**MANGIFERA INDICA.** This drug acts as an astringent upon all mucous surfaces. It is especially useful in patients suffering from atony with exhaustive hemorrhagic or mucoid discharges. *Dose:* Specific Medicine, Mangifera,  $\mathfrak{z}$ ss to  $\mathfrak{z}$ i, aqua  $\mathfrak{z}$ iv. Mix.  $\mathfrak{z}$ i every one or two hours.

## PHYSICAL THERAPY.

### A THEORY OF THE CAUSE OF X-RAY BURNS.

BY PERCY H. BRIGHAM, M.D., BOSTON, MASS.

HAVING had an X-ray burn covering an area of fifteen and one half by five and one half inches I was led to investigate the cause of same.

Finding that salt solution was the most satisfactory treatment of many observers I began my investigations along that line, believing that normal salt solution must replace, or neutralize, or aid in eliminating, or stimulate the tissues to overcome something which the X-rays developed in or removed from the tissues.

I exposed normal salt solution to the X-rays ten minutes, with the following results: First the solution gave a slight tingling sensation (like tincture of aconite) to the tip of the tongue after exposure. Second, the solution tasted much less salt after the exposure than it did before. I compared some of the exposed with the non-exposed solution of the same lot.

The specific gravity of ordinary tap water is 1000. Add one drachm of common salt to one pint of the water and the specific gravity becomes 1011. Expose the same under the X-rays for ten minutes and the specific gravity drops to 1009.

Two elevenths of the salt has disappeared. To disappear it must have decomposed, and if it decomposed it could only decompose into chlorine and sodium. What would happen if free chlorine and free sodium were set loose in the tissues? The chlorine would cause an irritation, and the sodium would unite with its affinity, water (of which there is abundance in the tissue) forming sodium hydrate (caustic soda).

As sodium unites with water it bursts into flame so theoretically if we could see the tissues by microscope while under the X-ray we ought to see little bursts of flame as the molecules of sodium united with the water here, there, and everywhere, over the rayed area.

Already we have by this THEORY gotten three reasons why we should get irritation from X-ray exposures.

1. Because of the free chlorine gas in the tissues.
2. A *THERMAL* burn as the sodium unites with the water in the tissues.
3. A *CHEMICAL* burn caused by sodium hydrate distributed over and through the rayed area.

Now for the reason repair of the injury is delayed or becomes nil. Sodium chloride normally present in the body determines the fluidity of the liquid tissues. The lessening of the amount of sodium chloride lessens the fluidity of the blood and other fluids. NUTRIMENT is carried by the blood to the capillary system, where it is given off by the process of osmosis (the passage of fluids through animal membrane) to the muscular tissues, etc., taking away products of metabolism or waste as it returns.

If two elevenths of the salt is decomposed the fluidity is decreased. If the fluidity is decreased the osmotic action is decreased, and the supply of nutriment is lessened, or if the action was carried out to its furthest conceivable termination why wouldn't some of the smallest capillaries become blocked, stasis taking place due to the prolonged action of X-rays, and the supply of nourishment thereby being cut off?

If my theory is true — I don't maintain that it surely is — we would get exactly what we *do* get, an irritation progressive in action till it sometimes develops into actual destruction of tissue, making an ulcerated condition which refuses to recover, except by exercising the most careful and persistent treatment, and sometimes not then, as evidenced by the loss of hands and fingers and even some deaths which have been reported.

According to the United States Pharmacopœia twenty-three grains of sodium hydrate can be made from one drachm of sodium chloride; therefore if in ten minutes two elevenths of sodium chloride is decomposed, two elevenths of twenty-three grains of sodium hydrate must be formed, or four and six elevenths grains of sodium hydrate every ten minutes over a comparatively small area. Divide this by ten and we have roughly two fifths of a grain of NaOH formed per minute throughout the limited area exposed to X-rays.

All persons require a certain amount of chloride of sodium to enable them to carry out the function of nutrition. The amount varies in different persons, some having a great deal more than others. I have found by experimentation that persons and lower animals in which salt was abundant would stand much longer and more often repeated X-ray exposures without irritation, than those who required and assimilated less salt. Therefore why would it not be a good prophylactic to over-charge persons to be exposed to X-rays with salt solution?

Another point that seems to uphold my theory of stasis of capillaries. Dr. ———, in the discussion of Dr. Kassabian's paper before the assembled convention in Boston, stated that some years ago he became affected with a certain amount of X-ray dermatitis, and that he began using white light on his hands for treatment and later as a prophylactic. If his hands were affected they were at this time, as he said, "as good as any hands in the room."

Now what does "white light" do as far as my theory is concerned? After X-ray there is lessened fluidity, and we will say partial (or complete) stasis of capillaries. The "white light" *dilates* the capillaries, causes an

increase of blood to the part, which, of course, is an increase of fluid and nourishment, and counteracts any ill effects which might have been caused by the X-ray exposure. Dr. ———, of Texas, who earlier in the convention had stated that he did not believe that X-ray burns were unavoidable, he having exposed great numbers of persons and never burned any one, after hearing my theory, said, "Well, that explains why I never burned any one;" I come from a town of hydrotherapeutic baths. The springs are salt, my patients all have drank it, bathed in it, and are probably saturated with salt. I explained that I believed they could probably afford to lose a little salt by decomposition, as their remaining amount would be enough if not perhaps an excess of the amount necessary to preserve the fluidity of the blood.

Dr. Waite, of Waite & Bartlett Mfg. Co., New York, stated to me that his X-ray dermatitis disappeared while he was crossing the ocean and reappeared when he got back inland. My treatment for burns is emphatically salt solution, *but* salt solution in *bulk* and *under pressure* so as to assure osmosis taking place throughout the burned area, and artificial feeding of white of egg, bovine, etc., also *under pressure*, for with a diminished and weakened capillary circulation you could not expect any great absorption of nutritive materials except they were forced to osmotic action by pressure or by some other expedient.

By this treatment I healed my fifteen and one half inch burn completely. and without scar, in slightly more than fourteen days. I have advised a number of persons having X-ray dermatitis of the hands to enclose their hands at night in a rubber glove fastened tightly at the wrist and distended with normal salt solution, alternating this treatment with sterilized bovine solution. I have been expecting reports from these several gentlemen regarding their progress, but so far have failed to receive them, owing, probably, to the short space of time that has elapsed since the convention of the Electro-Therapeutic Society. When received the reports will be submitted to the JOURNAL, as will also any further facts regarding the cause, effects. and cures of X-ray burns that may come to my notice.

In the morning when thou risest unwillingly, let this thought be present: I am rising to the work of a human being. Why, then, am I dissatisfied if I am going to do the thing for which I exist, and for which I was brought into the world?— *Marcus Aurelius Antoninus.*

A man shall and must be valiant; he must march forward and quit himself like a man.— *Thomas Carlyle.*

# DEPARTMENT OF DIETETICS

## THE TREATMENT OF NEURASTHENIA AND OTHER ALLIED CONDITIONS OF THE NERVOUS SYSTEM WITH SANATOGEN.\*

BY ROBERT J. CARTER, M.D. (LONDON), D.P.H. (ENGLAND).

*Late resident medical officer to the Hospital for Women and Children; formerly House Surgeon to the King's College Hospital and to the Lock Hospital, London, etc.*

The need that exists for an easy absorbable, concentrated, nutritious food preparation is evidenced by the number of attempts which have been made to place such a product upon the market, especially during the last few years. An ideal preparation of such a kind should possess three main features:

- (1) It must be practically tasteless.
- (2) It must be rapidly and readily absorbed.
- (3) Above all, it must be of exceptionally high nutritive value.

If in addition it possesses certain special or specific properties, that is a strong point in its favor.

Amongst the many preparations I have tried I find Sanatogen reaches more nearly the ideal than any other. It is composed of pure casein, with five per cent of glycono-phosphate of sodium, a most important addition to which I shall refer again as furnishing a value far higher than its nutritive power alone claims.

In selecting any food preparation for administration to a patient, when such administration is likely to continue for a lengthened period, it is absolutely essential to consider the pleasantness or otherwise of its taste. A food which nauseates by its taste or smell, however much persevered with, never in my experience acts as quickly or efficiently as one which is taken without distaste, and without exciting feelings of nausea. In this respect Sanatogen is excellent. In none of my cases were complaints made as to its taste. If carefully prepared according to the directions, no one can object to it — in fact, if given in fairly large quantities of milk it is practically tasteless, as I have proved from personal experience. Almost any of the ordinary invalid fluid articles of diet make an excellent vehicle for its administration. Of its ready and complete absorption there is no doubt. In a paper published by Dr. Vis and Professor Treupel, of Freiburg, careful experiment showed that where the

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ordinary nitrogen of the diet was replaced by Sanatogen, the amount of nitrogen excreted daily by way of the stool practically remained the same. In a further paper by Dr. Tischer and Dr. Beddies, of Berlin, the rapidity with which a normal stomach absorbed the food in question was found to be remarkable, three grammes completely disappearing in fifty-five minutes, whilst the same amount of mere casein took one hour and a quarter to completely disappear. The experiments described in these two papers, carried out with all the attention to detail which characterizes German investigations, can leave one in no doubt of the rapid and complete absorption that Sanatogen undergoes in the healthy stomach, and it is not too much to say that a precisely similar result is seen clinically in diseased conditions. Its food value is best observed clinically, and the cases which I have included in this paper amply show that in this respect it is of the highest value.

I have previously referred to the importance in this preparation of the casein being combined with five per cent of glycerophosphate of sodium. The combination with this salt facilitates proteid absorption from the stomach in a remarkable way. In the paper by Tischer and Beddies referred to above, instances are given showing that even in cases of disease Sanatogen completely disappears from the stomach half an hour sooner than egg albumen or casein dissolved by a sodium salt. That this is not the result of muscular contraction of the stomach walls, with its consequent ejection of the stomach contents, was proved in cases of obstruction at the pylorus, in spite of which the absorption was equally rapid, the combination of casein with glycerophosphate salts in nervous diseases of the neurasthenia type needing no further comment.

*Case I.*—H. S., female, *ætat.* thirty-five years, single, had suffered from neurasthenic symptoms since a severe attack of influenza eight years ago. She was a tall woman, height five feet seven inches, weight one hundred and nine pounds, complaining of inability to take food of any kind, except shredded wheat, without intolerable retching and vomiting, severe neuritic pains in legs, which almost prevented her from walking, constant headache and nausea. On examination, with the exception of a slightly dilated stomach, her organs were healthy. She had already undergone a strict Weir Mitchell course without benefit. Medicines of any kind she absolutely declined, asserting that they only made the vomiting and retching worse.

She was ordered two teaspoonfuls of Sanatogen thrice daily, with stomach lavage and glycerine enemata when necessary. The progress was remarkable; the vomiting ceased entirely. After four days' treatment milk was added to her dietary, and at the end of a week a gain of one pound three ounces was noted. The dose of Sanatogen was then increased to three teaspoonfuls, the diet added to daily, and at the end of the second week she expressed herself as "being better than she had felt for years," and a further increase of two pounds was registered. At the moment of writing, three weeks after treatment was commenced, the patient has increased seven pounds

in weight, has lost all pain, is eating ordinary food, and bids fair to become once more a useful member of society.

Another troublesome class of casein in which I have found Sanatogen extremely useful is chronic urticaria.

*Case II.*—H. H., ætat. twenty-eight, came to hospital complaining of “nettle-rash,” which had existed three months, during the whole of which time he had been under treatment elsewhere. On examination, the neck, upper part of chest and arms, abdomen, and groins were found to be covered with large, well-marked, typical wheals, whilst the whole body showed evidence of severe and continued scratching; factitious urticaria readily obtained. Two teaspoonfuls of Sanatogen in milk thrice daily was ordered, and strict, simple diet. When he came again in a week all traces of acute urticaria had disappeared, and he had been able to sleep well, and had been free from irritation for three days. The treatment was continued for another week, when he was discharged cured.

*Case III.*—A. H., female, ætat. forty, consulted me for chronic urticaria of five months’ duration. The irritation was most distressing at night, and the insomnia of long duration had produced a condition of great debility. Treatment of every kind, including strict milk diet, had had no result. Sanatogen, two teaspoonfuls thrice daily, was prescribed, and ordinary diet. When seen again at the end of a fortnight, the improvement was marked, the irritation had completely disappeared, sleep was normal, and the patient was extremely gratified with the result of the treatment.

Sanatogen is a valuable preparation in those forms of neuralgia or neuritis not associated with the presence of any local irritant.

*Case IV.*—A girl of seventeen had for several weeks suffered from intermittent attacks of right supra-orbital neuralgia of considerable intensity. There was no malarial history, but the patient was anemic. The red blood corpuscles numbered 3,900,000 per c. m., and were of good size and shape. The leucocytes were 5,800, and the hemoglobin value (Haldane) was forty per cent. Quinine and arsenic both failed to improve the condition of the blood or to relieve the pain. Sanatogen was then ordered and taken for twenty-one days, when the red blood corpuscles numbered 4,200,000 and the hemoglobin was fifty-six per cent, the pain gradually subsided, and the patient made a good recovery.

The value of Sanatogen as an aid to digestion as well as a food is well illustrated by the following:

*Case V.*—H. C., ætat. thirty-four years, two years ago was found to be suffering from acute phthisis in both apices. After three months open-air cure in the south of England, and three months at Caux, in Switzerland, he went to the Cape, and returned perfectly well last October. In January of this year he, to avoid the cold winds, took a sea voyage. I saw him March 10, immediately after his return, he was suffering from marked dyspepsia,

loss of appetite, and had lost ten and three quarters pounds in weight during his two months' absence. No phthisical signs could be found in his lungs. He was ordered two teaspoonfuls of Sanatogen thrice daily, and ordinary diet. At the end of a week his indigestion had entirely gone, his appetite was normal, and he had already increased two and one quarter pounds in weight.

Continental observers have also reported the beneficial effect this preparation exerts in stomiachic dyspepsia, especially when associated with hyperacidity.

In cases of acute chorea both in boys and girls, Sanatogen forms a valuable accessory mode of treatment. This class of case is always unsatisfactory, owing to their tendency to repeated attacks and to the length of time, in spite of treatment, the choreiform movements persist.

*Case VI.*—A fair-haired girl, aged twelve, came under treatment for her fourth attack of chorea. The usual history of fright was absent, but she had pains in the joints, and there was a soft apical systolic murmur. She was kept strictly to bed and as free from excitement as possible. She was given five drops of liquor arsenicalis three times a day immediately after meals, and although at the end of three weeks there was some improvement, the choreic movements still persisted and involved the muscles of the face and arms. As she was somewhat anæmic, a blood count was made, and the red corpuscles were found to be 3,600,000 per c. m., with hemoglobin 49 per cent. She was given Sanatogen, and a week later the red cells had increased by 40,000 and the hemoglobin 3 per cent. The Sanatogen was well taken and improved the appetite. Gradually the movements decreased in severity, and at the expiration of a month had entirely disappeared. The red corpuscles then were 4,500,000 per c. m., and the hemoglobin 55 per cent.

It will have been noticed in the cases reported above the effect that Sanatogen has upon the blood as evidenced by the increase both in the number of red blood corpuscles and the percentage of hemoglobin.

It is common clinical experience to find anemia in varying grades after most of the zymotic diseases. Is this loss of red blood corpuscles and hemoglobin the result of the production of specific bactericidal serum, causing destruction of the red blood corpuscles, or is it not, as Wassermann suggests, that the blood-reproducing system, especially the red bone marrow, is exhausted by producing the bactericidal serum and, as a consequence, the production of red blood corpuscles suffers? If this is so, it is obvious that the mere introduction of iron preparation into a stomach enfeebled by disease will have but little effect. Obviously our first step is to improve the digestive powers of the stomach, aid the nutrition of the whole organism, and by so doing restore to those organs whose function it is to keep the blood at its normal standard, their usual activity. This, I think, Sanatogen does, and does effectually: certain it is that clinically we see that as a patient improves in health the red blood corpuscles increase in number, and the hemoglobin

rises, and that without the administration of the long tried remedies, iron and arsenic. Had Sanatogen merely a high food value this effect would not be produced, for it has been shown by numerous observers, Von Ziemssen, Immermann, and others, that the treatment of anemia on purely dietetic lines produces but a slight rise in the percentage of the hemoglobin, and, moreover, this initial rise is not maintained, and iron in some form or another is necessary for a cure.

Amongst the difficulties in treating chronic alcoholism, the most pressing is the need of something that on introduction into the stomach will relieve the craving for alcohol. Most of the drugs in the pharmacopœia have been called into service with but little result. Obviously if in addition to allaying the craving for alcohol we introduce a valuable nutritive preparation, the advantage is enormous, and in this direction I consider, in selected cases, Sanatogen will prove of inestimable service. It is a curious clinical fact that amongst confirmed alcoholics those cases that in addition to alcohol are able to take food seem able to go on, in many instances for years, without developing the usual symptoms of alcoholic poisoning, cirrhotic liver, neuritis, etc., whilst, on the other hand, those who practically live upon alcohol soon fall victims to their indulgence, although the quantities of alcohol taken in each case may be the same. That food concomitantly taken with alcohol is able to some extent to retard the deleterious effects of the latter is, to my mind, indisputable. The value of Sanatogen in some forms of chronic alcoholism is seen in the following:

*Case VII.*— A married woman, ætat. thirty-six, had for many years given way to habits of intemperance. She was never distinctly intoxicated, but her general appearance indicated that she was imbibing far more alcohol than was either wise or necessary. She had lost most of her good looks, her face was always flushed, her hands were tremulous, she was unable to write even the simplest letter in the morning or the early hours of the day, and her temper was distinctly irritable. Her moral tone had deteriorated, and although in a good social position, she was seen on more than one occasion coming out of a low saloon not a mile from her residence. She was catholic in her tastes with respect to drink, and usually commenced in the early morning with a pint of old ale, followed by a wineglass of green chartreuse. Many attempts were made to reclaim her, and for a time she was in a home for inebriates. There was an improvement, but it was soon followed by a relapse. A trip to Scotland, with plenty of outdoor exercise, improved her assimilative powers, but in no degree diminished the craving for alcohol. Large doses of perchloride of iron were given, but had no effect other than producing severe constipation. Sanatogen was then recommended, and agreed admirably. She was honestly anxious to get well, and the Sanatogen apparently improved her will-power to such an extent that gradually she diminished her allowance of alcohol, and suddenly, to the astonishment of her family, became a stanch

teetotaler. She has taken no stimulant for six months, and one is justified in hoping that her cure will be permanent.

It is well known that compounds containing phosphorus in a really assimilable form are of much value in cases of nervous exhaustion consequent on chronic, functional, or commencing organic disease. It has been supposed, and not without reason, to supply to the nerve centers and tissues those vital elements in which they are deficient, and to improve nutrition in much the same way as the administration of lime produces the growth of bone, or iron improves the hemoglobin of the red blood corpuscles.

*Case VIII.*—A well-known surgeon, aged fifty-four, contracted syphilis in the course of his professional avocations, the point of entrance of the virus being a minute abrasion at the margin of the nail of the index finger. It was for a time overlooked, and the diagnosis was not established until a roseolar rash appeared on the thorax and abdomen. Small doses of mercury exerted a beneficial effect, and although there was an attack of iritis it soon subsided. The patient took a long sea-voyage, and at the expiration of six months his health was apparently re-established. On attempting to resume work, however, it was found there was considerable impairment of mental capacity. He frequently stumbled over his words, and from having been a good public speaker displayed a curious hesitancy and want of facility. In writing prescriptions he was not only inaccurate with regard to doses, but found a difficulty in recalling the names of common pharmacopœial preparations. In the matter of keeping appointments he was strikingly remiss, and had to be constantly reminded of his engagements. He was placed on various combinations of arsenic, iron, and strychnine, yet derived but little benefit. He then tried Sanatogen, taking it systematically three times a day. At the expiration of a fortnight there was some improvement, and a month later his mental powers were distinctly better. He continued taking the Sanatogen for six months, and was then almost as well as before his illness. He stated that his brain seemed to work more easily, that he had to a very great extent resumed his original decision of character, and that he could perform his daily avocations without fear of breaking down.

It is probably in cases of weakening or exhaustion of the nervous system, accompanied by various forms of mental and bodily inefficiency, that Sanatogen proves most useful. They are sometimes described under the name of neurasthenia, but they are in reality "borderland" cases, cases in which there is a perversion of the mental and moral faculties, but unaccompanied by overt acts of insanity or any definite delusion which would justify their being certified and confined to a lunatic asylum. Their symptoms vary very much, and in the cerebral or psychic form the most common complaint is an inability to perform with accuracy and precision ordinary mental work. There may be anesthesia or hyperesthesia, and there is commonly pain, referred either to one or more of the peripheral nerves or to the abdominal viscera. The con-

dition of the tongue, of the bowels, or of the mind often occupies much of the attention. They may be skilled workers, but after a time the quality of their work deteriorates both in scope and in originality. They are as a rule middle-aged men who have lived an active life and have a history of gout or syphilis. They may develop general paralysis or tabes, but as a rule under skilful guidance they escape their dangers. Rest, an outdoor life, and Sanatogen will often effect a cure. Their most highly developed cerebral centers are temporarily irritable and thrown out of gear, but their recuperative powers are not exhausted, and if they can be judiciously aroused the prognosis is by no means bad, and there is a reasonable hope of recovery and of a complete resumption of active mental capacity. Improvement, however, is slow, and the tonic treatment should be persevered in steadily for some months. Many cases bearing on this point could be quoted, but the type is so familiar that it will be readily recognized.

In many cases of hypochondriasis Sanatogen proves strikingly useful.

*Case IX.*— A man, ætat. thirty-six, complained of persistent depression of spirits. He freely admitted that he could assign no cause for it. He was unmarried, his income was ample, he was received in the best society, and he had many sources of amusement and occupation. He was an athlete and fond of sports of all descriptions. He passed much of his time in the open air, and was the picture of physical health, yet in spite of this he was persistently unhappy, and seriously contemplated putting an end to his existence. He had consulted many physicians, all of whom declared, after careful examination, that they could find nothing wrong with him. He was constantly taking medicines, and had visited most of the famous health resorts of Europe. By some chance he came across Sanatogen, and this he took with avidity. At the expiration of three months he slept better, his appetite improved, his bowels became more regular, and his attacks of depression were less frequent and less severe. Finally he became engaged to be married, and this completed his cure.

The necessity for the sterilization of milk before its use, especially with children, on account of the danger of zymotic infection, has now become perfectly well known amongst parents, but the danger of feeding infants and children upon sterilized milk alone does not appear to be sufficiently understood. It has been shown by Berdez and Raczowski that milk loses lecithin by even being heated to 60 degrees C. for half an hour. The process of sterilization, however carefully carried out, causes a loss of organic phosphoric acid, which is an essential requisite of children's food, its continued absence from the milk in many instances causing the well-known clinical picture of Barlow's disease (Scurvy-Rickets). The addition of small quantities of Sanatogen to sterilized milk will remove at least one objection to its continued use in the artificial rearing of children.

That Sanatogen from its properties would be useful in rickets can be readily understood. In a paper by Dr. Schwarz (*Deutsche Medicin. Wochenschrift*) on cases of rickets treated by Sanatogen, he speaks most highly of the clinical results. The appetite improved, the weight increased, and, what is most important, the diarrhoea, when present, rapidly disappeared, bone formation increased, the rachitic process ceasing, and the bones growing firmer and more resistant. These observations are of the more value, as those cases only were treated in which proper treatment and nursing elsewhere had failed to produce any improvement. Whatever may be the view taken as to the causation of rickets, either according to Trommer, that it is due to a central nervous disturbance, or whether, as is more commonly accepted, that it is due to inability of the digestive organs to assimilate a deficiency of lime salts, Sanatogen would appear to act as a specific remedy of this disease.

The variety of conditions of ill-health in which Sanatogen has proved so efficacious, as evidenced by the cases quoted in this short paper, is in itself an indication of the value of this preparation. I have purposely chosen from my notes different types of cases, so that its range of usefulness and applicability might be the better estimated. That any product of the laboratory will be able in the future to replace the ordinary articles of diet is problematical, even if the evolution of mankind had reached such a point that in place of a six-course dinner the individual would be satisfied with two or three tabloids of a chemical preparation, representing sufficient nitrogen, carbohydrates, and fats for his daily metabolism. As physicians we must be content to welcome a preparation such as Sanatogen, which, as these short notes show, is useful in many directions in our perpetual struggle against the ravages of disease and the deleterious results of our so-called civilization.

Man might live at first  
The animal life; but is there nothing more?  
In due time let him critically learn  
How he lives; and the more he gets to know  
Of his own life's adaptabilities,  
The more joy-giving will his life become;  
Thus man, who hath this quality, is best.

— Robert Browning

Show those qualities which are altogether in thy power, — sincerity, gravity, endurance of labor, contentment with thy portion and with few things, benevolence, frankness, no love of superfluity, freedom from trifling, magnanimity.— *Marcus Aurelius Antoninus.*

# EDITORIALS

## Journal of Therapeutics and Dietetics

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PITTS EDWIN HOWES, M.D., *Treasurer*

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PITTS EDWIN HOWES, M.D., *EDITOR.*

JAMES MARSHALL FRENCH, M.D., *ASSOCIATE EDITOR.*

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### ROOM ENOUGH AT THE BOTTOM

It is an old saying that there is room enough at the top. Nonsense! Success is a pyramid, and its base is at the bottom. "Hitch your wagon to a star" will do very well for an Emerson, but for the most of us it is safer to take the advice of Holland, and tie up to a Virginia rail fence, rather than spend our time in hunting for a star.

In the practice of medicine Emerson's maxim is followed by those who spend their time in perfecting themselves in those rare and difficult cases which come to most men but once in a lifetime, and to many of them not even once. To study the unusual and the recondite, to perform difficult and almost unheard-of operations, to do what no one has ever done before, to record cases so unique that no one has ever heard of them before and most never will again, to be able to do what few can do is to aim at the star, to seek the heights. All this is well enough, and a few men can succeed in that way. But it is the little things that make up every-day life and every-day duties. It is here that the most of the doctor's work is done. These things lie at the very bottom of the pyramid, and here there is room enough. The doctor who



can break up a common cold, who can successfully treat headaches and derangements of digestion, who is at home with warts and corns and ingrown toenails, who can dress cuts and bruises and open abscesses in good shape, who knows what to do for eczema and acne and ivy-poisoning, who can safely pass a catheter over an enlarged prostate, who can ease the pains of inflammatory rheumatism, who can carry the babies safely through the miseries of summer complaint, and the old men through the dangers of pneumonia, he is the one who will make a success of the practice of medicine. What men want is to be eased of their pains and cured of their diseases. To do these things is the highest duty of the physician. And in doing them, it is the little things that count. "Trifles make perfection, and perfection is no trifle." There is room enough at the bottom.

J. M. F.

### CURES FOR A COLD AND LA GRIPPE.

The editor of the *American Medical Journal* declares that gelsemium is as nearly a specific for la grippe as quinine is specific for malarial fever. Also, that the brown iodide of lime, one ten-grain dose on going to bed at night, will abort a cold quicker than any other known remedy. Now if these statements are true they are of interest to a great many persons, doctors and others.

William Henry Morse, in the *Medical World*, writes of one of these remedies as follows: "When any of us (my family of seven) contracts a cold, he or she makes a rush for my laboratory. I am included here, of course, and we reach for only one drug and take it. We take it a bedtime only, and in every case, if the cold is under twenty-four hours old, no sign of the cold remains in the morning when we rise. Now mind what this is for: it is for a common cold, or if you please, an acute catarrhal condition (a coryza) of the nose with or without extension to the bronchial mucous membrane. It will have little or no influence on epidemic bronchitis, or la grippe, in the way of curing it or breaking it up, but it will modify it favorably. The remedy is the *tincture of gelsemium, in fifteen to twenty drop doses at bedtime only, and in one dose.*"

This does not agree in all respects with the first writer, but it does do one thing the first man does not, gives a more definite indication, namely a coryza, an acute catarrhal condition of the mucous membrane of the nose. And it makes us think that there may be something in it, after all.

Still another writer in the *Medical World* writes: "If you will take ten drops of fluid extract of gelsemium every hour until it affects your eyes to the extent of double vision, and then take it just often enough to keep up that effect for six or eight hours (or longer if you prefer), you will cure your cold

every time in less than thirty-six hours just so sure as the sun shines. It is equally effective for the grip if taken in time."

Now I do not know by personal experience or professional observation anything about the effect of gelsemium in these cases, for I have never tried it. But I have some little personal experience with the brown iodide of lime, or calcium iodized, and I am learning to rely upon it in a certain class of colds more than any other remedy. But my colds do not begin with a coryza but with a laryngitis, or congestion and inflammation of the larynx. Knowing of the wonderful effects of this remedy in croup, I thought it worth trying in other throat troubles. And I can say that nothing else has seemed to act as well in these cases. The first symptoms of a cold in my case are usually a tickling in the throat, with an undue secretion from the mucous membrane of the larynx, causing an unpleasant hemming to clear the throat. For this condition ten grains of calcium iodized at bedtime, or in divided doses during the day has almost always succeeded in aborting the trouble promptly. I have taken it in tablets (calcidin, Abbott), and in powder; in small doses repeated, and in single large doses; and I am not at this writing prepared to say definitely which way is best. But I am prepared to recommend others who suffer from the same symptoms to try it, and give their testimony as to the result. As for gelsemium let us try that in the cases for which Morse has recommended it, those beginning with coryza. There are a good many remedies for colds and la grippe; the great thing is to know just how and when to use them. It stands to reason that colds which begin in different ways should be treated differently. Let us try to get definite indications for the different remedies and then we shall be able to break up a cold, whether it be on ourselves or our patients.

J. M. F.

### BOOK REVIEWS.

A NUMBER of "book reviews" are crowded out of this number for want of space. Watch for them next month.

### ANNOUNCEMENT.

COMMENCING with the April number, we are to begin a series of articles upon the fundamental principles of the various forms of electricity, to be followed by their application to different manifestations of diseased conditions.

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## SULPHIDE OF CALCIUM

THE keynote for its use is *its power for preventing and arresting supuration.*

In inflammation threatening to end in suppuration it will avert the formation of pus. After the pus has really formed, its action is still more pronounced. Then it not only hastens maturation, but diminishes and circumscribes the inflammation, promotes the passage of pus to the surface, and the evacuation of the abscess.

If you are looking for facts to prove these statements administer the one tenth grain of sulphide of calcium every hour or two in some of your cases of tonsilitis when there is a tendency to form deep-seated abscesses in these glands, and watch the results. Compare these with what you have obtained before with other means. Take also some deep-seated abscess on other portions of the body and treat with the same sized dose and see how much quicker relief is procured. In both boils and carbuncles this remedy will yield excellent results. The one tenth grain given every one, two, or three hours will prevent the formation of fresh boils and also lessen the inflammation and reduce the area of those already existing. When the skin is not broken and the slow-separating core not yet exposed, the sulphide of calcium will often convert the boil into an abscess, so that on bursting, pus is freely discharged and the wound at once heals; or if the center of the hardened swollen tissues is not yet dead, the pustule dries up, the inflammation subsides, and a hard knot is left which disappears in a few days without the formation of a core, and without any discharge. The effect of this remedy is equally conspicuous in mammary abscesses, although in rare instances they appear temporarily to increase the pain,— a fact which seems sometimes to hold good with respect to boils, though as a rule the pain is speedily mitigated.

The good effects of sulphide of calcium are often observed in certain scrofulous sores not uncommonly seen in young children. They will readily yield to its use.

It may be urged that it is difficult to imagine how this remedy can produce effects so different and apparently opposite as the dispersion of inflammation in one case and the expulsion of pus in another; poultices, however, and hot fomentations both subdue inflammation and prevent suppuration, and in other cases considerably hasten the evacuation of pus.

# DEPARTMENT OF THERAPEUTICS

## DRUG STUDIES.

### POPULUS TREMULOIDES.

BY J. M. FRENCH, M.D., MILFORD, MASS.

POPLAR bark has long been used as a stomachic and general tonic, mostly by the herbalists and botanics, and in domestic practice. It was claimed by the older writers that it possessed important properties as an antiperiodic, and some even claimed that it would replace quinine in the treatment of intermittent fever. But in spite of these claims, it has never come into general use. Of late, in consequence, perhaps, of improved methods of preparation and the separation of the active principles, which have thus been subjected to more careful study, there has been evident a renewal of interest in this drug, and a desire to study its action more carefully, and the more accurate determination of its properties. The object of this paper is to call the attention of physicians of all schools who are interested in securing the best means of treating disease, regardless as to whether they be new or old, or advocated by one class of physicians or another, to this old remedy, for the purpose of inducing them to join in a study of it, in order if possible to add something to the general knowledge of the profession on the subject.

Is populus simply one more bitter tonic — of which we already have an abundance? If so, we have no need of it. We have enough fairly good remedies for most of the common conditions of disease. What we need is, first, better remedies than we now possess for particular conditions of disease, whether common or rare. Secondly, given the remedy, we need to learn the exact indications for its use; in other words, the particular condition in which it will prove a benefit. To this end we will in this paper consider the general properties of populus, as given by the different writers on the subject, and later hope to hear from those of our readers who have used the drug in their own practice, or who have, from any source whatever, learned facts in relation to it which are not herein set forth. Send in these facts, whether favorable or unfavorable, and they will either be published as sent in, or else embodied later in a collective investigation report, due credit being given.

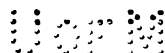
There are a number of different varieties of poplar which are found in this country, differing in some minor particulars, but all possessing the same general properties. Among these are *Populus tremuloides*, or American aspen; *Copulus tremula*, European aspen; *Populus alba*, silver leaf poplar; *Populus*

nigra, black poplar; *Populus monilifera*, cottonwood or necklace poplar; *Populus balsamifera*, balsam poplar; and *Populus candicans*, balm of Gilead; all belonging to the natural order Salicaceae, Willow-worts. These are best represented by *Populus tremuloides*, the white poplar or American aspen. This is a small forest tree which grows abundantly in Lower Canada and the northern parts of the United States. It reaches a height of from twenty-five to fifty feet, and has a diameter of from eight to twelve inches. It is covered with a smooth bark which is of a greenish-white color except on the trunks of very old trees. The leaves are roundish-cordate, abruptly pointed, dent-serrate, with petioles compressed, rendering the leaves tremulous in the slightest breeze, whence the name, *tremuloides*. The buds or aments are about two inches in length, and pendulous, with silken hairs, and appear in April, either before the leaves, or while the leaves are forming. The fresh bark is the part chiefly used in medicine, although the leaves and aments also possess medicinal properties, and are sometimes employed. They contain the same active principles as the bark, but in somewhat different proportions, and hence their action varies slightly.

The chief active constituents of populus are the two glucosides, populin and salicin. It also contains a small amount of resin and essential oil.

Populin, the first glucoside, is of very light specific gravity, and snow-white in color. It has a slightly bitter, sweetish taste, somewhat resembling that of licorice. It is soluble in about two hundred times its weight of cold, and seventy times its weight of boiling water. Heat melts it into a colorless, transparent liquid. It was first isolated by Braconnot, and is found in the leaves and bark of several species of poplar. It is said that the leaves of the *populus tremula*, an allied European species, contains more populin than the bark, and hence is used to greater advantage in isolating the glucoside. In its physiological and therapeutic effects it is said to resemble quinine. Very little can be found in medical literature concerning its use in medicine. No preparation of it is to be found in the market, owing probably to the cost of separating it, and its consequent high price.

Salicin, the second glucoside, is found in a number of different species of populus, also in *salix*, the willow, *gaultheria procumbens*, the wintergreen and *betula lenta*, the sweet birch. It occurs in colorless or white and silky, shining needles, or as a crystalline powder. It is without odor, and has a bitter taste; is permanent in the air, and neutral in reaction. It is soluble in twenty-eight parts of cold and seven tenths of boiling water, in thirty of cold and two of boiling alcohol, and is nearly insoluble in ether and chloroform. Its properties are those of a tonic, antiperiodic, and antirheumatic. It is also a sedative to the sexual system of a high order. It is found in great abundance in the aments or young buds of the *salix nigra*, which is largely used by the eclectics as a sexual sedative.



The concentration, which is also known as populin, contains both the glucosides, together with the resin and essential oil, in the proportions in which they exist normally in the plant. This is prepared by the alkaloidists in granules of one sixth grain, and is used by them as a bitter tonic and mild antipyretic. It is said to be useful after the severity of a malarial attack has passed, also as a tonic astringent in catarrhal conditions of the alimentary and urinary tracts. It represents quite fully the medicinal properties of the entire plant.

The primary effect of poplar bark is to improve the appetite and digestion. Scudder states that its principal action is exerted on the viscera of the small intestines.

Populus has also a decided affinity for the genito-urinary tract, and is thought to aid the recuperative powers of the kidneys when undergoing granular degeneration. In small doses it is effective in tenesmic vesical irritation following urination.

Homeopathic authorities state that the gastric and urinary symptoms of populus point to its usefulness in dyspepsia and catarrh of the bladder, especially in old people. A good remedy in vesical troubles after operation. Indicated by fulness of the head, and sensations of heat in the surfaces of the body. Also in night sweats. Urinary symptoms, severe tenesmus, painful, scalding; urine contains mucus and pus; prostate enlarged. Stomach symptoms, indigestion, with flatulence and acidity.

The fresh buds of the poplar have a balsamic odor, and contain more of the resin and volatile oil than does the bark. A fragrant ointment which possesses valuable antiseptic qualities is made by digesting poplar buds in hot lard, and boiling them gently until all the moisture is dissipated.

The dose of powdered poplar bark is one dram two or three times a day, best taken in hot or cold infusion.

Of the fluid extract, one half to two drams three times a day.

Of the specific medicine and normal tincture, from a fraction of a drop to thirty drops.

Of the glucoside populin there is no recognized dose.

Of the glucoside salicin, ten to thirty grains.

Of the concentration, one sixth to one half grain three or four times daily.

The indications for which we would suggest the testing of populus and its preparations are as follows:

(1) Marked general debility, with impaired digestion and enfeebled nutrition.

(2) Malarial and other fevers, especially the chronic forms of malaria, with their complications and sequelæ.

(3) Tenesmic vesical irritation, especially tenesmus after urination.

popu

(4) As a sexual sedative. The presence of salicin gives to populin a sedative action on the sexual function which may render it useful in these cases. We are not aware that it has been tested for this purpose.

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## A STUDY OF THE TWELVE TISSUE REMEDIES.

BY JOHN WILLIAM FYFE, M.D.

### NO. II.—CALCAREA PHOSPHORICA — PHOSPHATE OF LIME.

THIS remedy is the phosphate of lime prepared by trituration with sugar of milk.

*Calcarea phosphorica* is employed with curative results in diseases which are caused by an abnormal action of the lime molecules in the body, such, for instance, as the unnatural growth and impaired nutrition of bones and other textures found in rickets and similar diseased conditions. Having ascertained this much of the action of the phosphate of lime, it readily becomes apparent that it must be indicated in all bone diseases resulting from or depending on a depraved quality of the blood, as well as in many abnormal states, including diseases which involve the skin.

In all cases in which, from any cause, an insufficient amount of the phosphate of lime is assimilated to supply the needs of the body, causing imperfect cell growth, and consequently destruction of tissue, especially of the osseous and glandular systems, *calcarea phosphorica* becomes a medication of great usefulness. In the convulsions which sometimes afflict weakly, scrofulous children during dentition, it exerts a restraining influence, and many times increases nutrition. It also possesses a power which is of value in acute diseases, either directly or in preparing the way for other indicated remedial agents, by stimulating the system to more vigorous action.

In chronic wasting diseases the phosphate of lime exerts a tonic influence which is often of the greatest value to the patient, and when the phosphates in excess are found in the urine, showing imperfect secondary assimilation and inefficient working of the excretory organs, it is used with advantage. It has also been employed with improving results in anemia of young and rapidly growing people, and its tonic influence has frequently been decidedly marked in cases of women weakened by too frequent child-bearing, prolonged nursing, or excessive menstruation and leucorrhea. In diseases accompanied by an exhaustive discharge, such as bronchitis, tubercular diarrhea, and night sweats, its action is corrective in its direction, and in abscesses and scrofulous sores its influence on the secretions is such as to enable it to act curatively.

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- In old age, when the regenerative function decreases in the nervous tissue it often exerts an influence which conserves vitality, and in senile cutaneous itching its action is decidedly corrective.

In tuberculosis, when there is great emaciation, hemoptysis, and night sweats, the judicious employment of this preparation of the phosphate of lime often perceptibly mitigates the patient's sufferings, and in osseous enlargement of rachitic children it is used with much advantage. This preparation of the phosphate of lime, in ten-grain doses three times a day, has been highly recommended as an efficient remedy in chlorosis, and in chorea occurring during puberty it is said that the same amount of the drug exerts a quieting influence and aids much in the treatment. Its action in the spasms and pains which are sometimes caused by anemia is in a curative direction. Pains of this character are often accompanied by formication, sensations of coldness, and numbness. This agent is often useful in the treatment of pains situated at points where bones form sutures or symphyses; and in numb, crawling pains caused by chilliness, due to anemia and a tendency to perspiration and glandular enlargement, its action is decidedly corrective. Headaches of young girls, who are maturing and are nervous and restless as well as often troubled with a diarrhea resulting from an immoderate use of jellies and sour articles of food, are often promptly relieved by small doses of calcaria phos. Its use also acts as a preventive of such headaches. The phosphate of lime is employed with great benefit in chronic catarrh of the ears, accompanied by throat affections, and in cold in the head, with albuminous discharge from the nose it is often the only needed remedy. In chronic enlargement of the tonsils, and in clergymen's sore throat its beneficial action is unmistakable, but not as prompt as is that of collinsonia. In marasmus and enlargement of the mesenteric glands it is believed by many physicians to be essential to a good treatment, and in cases where the teeth develop slowly or too rapidly decay, the phosphate of lime constitutes a much-needed remedial agent.

In cholera infantum, when the stools are watery, profuse, scalding, and very offensive, calcaria phosphate will exert an influence which will aid much in the treatment. It is also useful in the common summer complaint of children, and it often removes a disposition to intestinal worms in anemic and weakly children. "Wetting the bed," so common in young children, also comes within the range of the usefulness of this agent. Enuresis in old people is much modified by the continual use of the phosphate of lime, and its action is of a decidedly relieving character in the itching and soreness likely to afflict anemic persons who are victims of chronic gonorrhea. In senile itching of the skin it is also a useful agent. As a means of preventing the reformation of gravel, calculus, and phosphatic deposits, calcaria phosphate has often been employed with advantage. In rheumatic gout, with severe





cramps in the calves of the legs, it has been used with some benefit, but for the removal of cramps it is inferior to *viburnum prunifolium*. In neuralgia, the pain being deep-seated, as if in the bones, it is employed with a curative result, and in chronic synovitis it is used with much benefit. It exerts a quieting influence in children who start up from sleep in a frightened manner, but for this form of nervous irritation *rhus toxicodendron* is much more effective. *Calcareæ phosphate* is also believed to be useful in spinal curvature in young girls, especially at puberty.

In the leucorrhea of young girls, when the discharge is like the white of an egg, and when menstruation is too frequent or too early, the phosphate of lime has been found useful as a constant tonic. It is also of value in the treatment of adults when the menses are too late and dark, especially when accompanied by great weakness, distress, and rheumatic pains before or during menstruation. In many of these cases the uterine pains are accompanied by a severe backache and a sensation of weakness in the uterine region. In the vaginal pruritis, which often afflicts old women, it constitutes a very efficient constitutional remedy.

This salt is worthy of further study, and the following indications, taken from Fyfe's *Modern Materia Medica*, suggest the lines along which it may most profitably be studied:

"Tardy formation of callus around the ends of fractured bones; unnatural growth and defective nutrition of bone, especially in rickets and similar diseased conditions; anemia of young, rapidly growing people; diseases characterized by exhaustive discharges, such as chronic bronchitis, tubercular diarrhea, and night sweats; abscesses and scrofulous sores; slow development of teeth; marasmus; chronic synovitis; eczema, with yellowish-white scabs or vesicles in anemic, scrofulous, or gouty constitutions; ulcers on cornea; chronic enlargement of the tonsils; heartburn and flatulency; catarrh in scrofulous or gouty constitutions; complexion dirty-white or brownish."

The dose of the third trituration of this drug is from five to ten grains, but it is successfully employed as follows: *Calcareæ phos.*, 3x, gr. xx to  $\mathfrak{z}$ i water,  $\mathfrak{z}$ iv. Teaspoonful every hour.

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## THE ALKALOIDAL TREATMENT OF PNEUMONIA.

BY W. C. ABBOTT, M.D., CHICAGO, ILL.

IN patients with a full bounding pulse and a hot dry skin — sthenic cases — begin treatment with aconitine, veratrine, and digitalin (*Defervescent Comp. No. 1*); or in patents having a small, quick, thready pulse and a hot, dry skin — asthenic cases — give aconitine, digitalin, and strychnine (*Dosi-*

metric Trinity No. 1). One granule of the combination selected should be given every fifteen to thirty minutes until the pulse softens or the patient commences to sweat freely; then one every half hour to one hour as needed to maintain this effect. Keep the pulse at eighty or under if possible. Envelop the *entire* thorax (and from chin to low on hips) in a thin, close-fitting jacket, thickly "quilted" with raw cotton, or the common "batteg," well greased. If the pain calls for treatment give a few doses of byronin or hyoscyamine and codeine singly or in combination as indicated. Always secure complete defervescence and rest, no matter how much drug is required. Some cases do better on the above formulas alternated. Treatment should always be adjusted to fit.

Clean out the primæ viæ with one sixth grain doses of calomel and podophyllin half hourly until one grain of each is taken; heaping teaspoonful of Saline Laxative in hot water and repeat every hour till bowels move freely; then give one or two five-grain tablets (usually one) of the Compound Sulphocarbolates — Intestinal Antiseptics W-A — every two hours; or enough combined with occasional doses of Saline Laxative to keep the bowels sweet and clean. If stools are malodorous after they cease to be dark (almost black) in color, calcium sulphide granules, gr. one sixth each (twelve to thirty-six in divided doses daily) q. s. should be used as a systemic antiseptic, and nuclein should be pushed. Both intestinal and systemic antisepsis is of the utmost importance.

If seen early and properly selected remedies are pushed rapidly, nearly every case may be aborted. If the patient is naturally weak and has a rapid, thready pulse instead of a full, bounding pulse, always give strychnine arsenate in place of veratrine. Codeine may be used to quiet cough if required, and emetine to facilitate expectoration. Apo-morphine in small doses for expectorant and relaxant effect often works best of all. If the pneumonic condition exists in a very young or very old patient and he does not cough and clear the bronchial tubes sufficiently, the stimulating expectorant, sanguinarine nitrate, should be used in just dose enough to produce sufficient coughing to rid the bronchial tubes of accumulated secretions. The complicating bronchitis may be as dangerous as the pneumonia itself. In such cases Calcidin (iodized calcium) is an exceedingly valuable remedy; furthermore, nothing can excel it for delayed resolution in any case. For the heart, strychnine has long been our sovereign remedy, but for heart waverings, in the earlier stages, we strongly advise the substitution of cactin, gr. one sixty-seventh (one or more as needed), in place of strychnine. Later on, in cases foolishly allowed to run their course, the whip, strychnine, may be needed; and when rightly used will often prove a life saver.

It is of the greatest importance in all attacks of pneumonia to have a hyperleukocytosis present. For the production and maintenance of this

physiologic state, Nuclein, Abbott, is the greatest known remedy. In the milder cases give twenty drops three times a day on the tongue without water. In the more severe cases give twenty to thirty minims every twelve hours by hypodermic injection into deep muscular tissues. Nuclein not only produces hyperleukocytosis, but it acts as a powerful stimulant to every cell of the body.

In all cases leave the patient on strychnine or the Triple Arsenates with Nuclein, and occasional doses of cactin for the convalescent period, and continue the Saline Laxative and Intestinal Antiseptics that you have used throughout the case, q. s., as required.

The gist of the whole thing being: Forced defervescence, elimination, intestinal disinfection, systemic disinfection, local protection and strong support to nature's fighting forces.

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### VERBENIN IN EPILEPSY.

#### EDITOR JOURNAL OF THERAPEUTICS AND DIETETICS:

What I shall have to say on the subject of verbenin will be supplementary to what has already been given in the paper of Dr. French in the February number.

After suggesting the manufacture of the concentration from the plant *Verbena Hastata*, it was used by myself and others with varying success. At the time the writer could not quite understand why it should cure one case and not cure another which seemed no more obscure, where in both instances the source of the irritation could be reached and removed. But since *Solanine* has been brought forward, the case seems to be, in a measure, at least, cleared up.

The suggestions for the use of *Solanine* are to give it until the pupils are dilated or the throat is dry, and then enough to maintain an action just short of this. *Solanum Carolinense* belongs to the mydriatic group of plants, and while too little is known about its action for much generalizing, yet its action in the case of epileptics seems to be most favorable where the attack is ushered in by cerebral congestion. On the other hand, the cases cured by myself and others by the use of verbenin, I can see now, were those in which the source of irritation was visceral. To illustrate, I will cite a few cases. The first was that of a young lady wearing a tight corset, the pressure from above irritating the pelvic viscera. There was hereditary predisposition to epilepsy — the father being an epileptic — in consequence of which it did not require much irritation to bring on the spasms. Upon the removal of the corset and a short course of treatment with verbenin and one or two minor things, she was cured — that is, cured as every case is cured, to recur again in case of further irritation. In this instance, it was injudicious lifting which

brought on the attack again, but these were soon stopped, and I have reason to believe that they have not returned again.

Another case was that of a boy with phimosis and epileptic spasms from accumulation of secretions. He was circumcised, but no effort was made to treat his spasms, which continued. In the mean time he had developed an inordinate appetite. With verbenin and proper remedies to check the appetite till he could get it under the control of the will, this case was cured.

A third case was that of a young lady with cervicitis, who after an examination was referred to her home physician for treatment. A curetting of the cervix, and treatment with verbenin and whatever else was found necessary to meet the special conditions, cured this case.

In the light of the above I can now see why verbenin did not cure a girl eleven years old, whose spasms were ushered in with a flushed face, etc. At that time Solanine had not been brought forward, but I believe now that it would have cured her. Where the trouble is cerebral, or perhaps cerebrospinal, I have found that verbenin either did no good or made the case worse.

But verbenin will not cure visceral cases unless the sources of irritation are removed. In one case, I found intestinal parasites. These were removed, but still the spasms continued. A further investigation showed self-abuse. The case was dropped.

Another case, a girl fourteen years old, an inordinate eater, would have no spasms as long as her aunt could keep her and regulate her diet, but when she went home to her mother, who believed in eating all she wanted of everything, the spasms returned. This was a bright and in other ways a healthy girl, and if she could have been kept with her aunt she would now be a healthy young lady.

A four year old girl here had epilepsy as a sequel of pertussis, on whom verbenin had no beneficial effect. She finally died of meningitis.

PROF. G. H. FRENCH, A. M.,  
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### THERAPEUTIC NUGGETS.

**IODIDE OF ARSENIC** will be found very useful in aphonia in those patients who are poorly nourished and present the symptoms of a psoric taint, manifested by a dry, scaly eruption on the skin.

**IRIS VERSICOLOR** will be found valuable in those pustular eruptions on the head and face — especially in children — which are characterized by an acid diathesis. The child has sour breath, vomits sour ingesta, and has a greenish, sour-smelling diarrhea. The cure will be hastened by using externally a cerate, in which the iris has been incorporated, in conjunction with the remedy internally.

**DYSMENORRHEA.** Where this condition is found in those females who are inclined to be hysterical and emotional, *canabis indica*, given in iij gtt. doses three times a day during the intermenstrual period will produce a wonderful relief. This same dose should be given hourly during the menstrual period while the pain is severe.

**WHOOPIING COUGH.** Try ij to iij gtt. doses of *castanea vesca* every two hours in this affliction and watch your results. The cough will be lessened and the duration of the disease shortened. Reports on the use of this drug are requested.

**PREVENTION OF TEDIOUS AND PAINFUL LABORS.** The use of *caulophyllum* in ij gtt. doses every two hours for three months prior to full term will relieve these cases of very much of their disagreeable characteristics. At the same time it will have a tendency to prevent a premature delivery.

**GUARANA.** This remedy should be used in those headaches which are purely of a nervous origin. Among its prominent indications may be noted, severe headache with anemia; headache resulting from dissipation; mental exhaustion and mental depression; pain in the head which is increased by movement or noise; headache with pallid face and feeble pulse. *Dose:* Fl. Ext. x to xxx gtt. Spec. Med. j to xx gtt. Usual Prescription R spec. Guarana gtt. xx, Aqua ℥iv. Mix. Sig. Dose ℥j every hour or half hour until relieved.

**CHLOROFORM.** This agent will prove useful when administered internally in many different conditions. Chronic vomiting when produced by nervous causes will be relieved. Irritative coughs will be checked. It may be given by adding gtt. v to Aqua ℥iv and ℥j of this mixture administered every fifteen minutes until relief is produced.

**XANTHOXYLUM FRAXINEUM.** This drug should be more freely used. It is indicated where there is a relaxed condition of the mucous membranes with an increase of their secretions. It is especially useful in atonic conditions of the digestive apparatus. Flatulence in both the stomach and bowels calls for its employment. Ordinary dose ij to x gtt. every one, two, or three hours.

**SANTONIN.** This drug, when given in one-tenth grain doses two or three times a day will aid very effectually in ridding children of intestinal worms. It should be followed at night by a moderately active cathartic, and the medication continued until all manifestations of the intruders have been abolished.

**CUPRI SULPHAS.** This drug may be prescribed in cases of dysentery and diarrhea when the stools are streaked with blood and there is much tenismus combined with colicky pain. It should be given in doses from one thirtieth to one twelfth grain every three hours. It will prove effectual.

**PHYSICAL THERAPY.****FIRST STEPS IN MEDICAL ELECTRICITY.**

BY HERBERT MCINTOSH, A.M., M.D., BOSTON, MASS.

**FOREWORD.**

THE purpose of the following chapters is to present in a simple and readable form the elements of electricity, divesting the discussion as far as possible of abstruse or technical considerations, and thus rendering it useful to those who are deficient in the rudiments of this branch of study.

The therapeutic applications of electricity cannot be understood or intelligently made without a preliminary description of underlying principles. Following this will be a discussion of the various types of electricity used in therapeutic work, with a description of the devices employed to develop them, an enumeration of the diseases to the treatment of which they are applicable, and an estimate of the degree of success which may be expected from their employment.

**CHAPTER I.****MATTER, ETHER, ELECTRICITY.**

CERTAIN modifications in current conceptions of the ultimate constitution of matter have taken place within a comparatively short time, which ought at the outset to receive some consideration. These have reference first, to the atomic theory, and, secondly, to the ether which is assumed to fill all space, and act as a medium for the transmission of vibratory impulses imparted to it by different types of energy.

The atomic theory, as enunciated by John Dalton at the beginning of the nineteenth century, declares that the ultimate unit of matter is the indivisible atom. Recent investigations, stimulated by the discovery of radium, have led to the conclusion that the atom is not indivisible, as Dalton supposed, but is a congeries of corpuscles, or electrons, which are capable of disassociation under the influence of an electric current, or electro-magnetic induction.

An electric current is conceived of as a current of free electrons and electro-magnetic phenomena as phenomena produced by the inertia of the electrons.

An ion is a chemical atom or group of atoms, having either an excess or deficiency of electrons. In the former case it is electrically negative, in the

latter electrically positive. The vibration of electrons produces in the surrounding ether electro-magnetic waves, which manifest themselves as light and radiant heat and when suddenly arrested as the X-rays.

These may be regarded as the latest speculations upon these highly interesting subjects. They may be slightly elaborated thus: An atom is a mass of positively electrified matter, made up, however, of a varying number of negatively charged corpuscles, which are called electrons. A hydrogen atom is assumed to have about 1,000 of these. The atomic weights of the different elements are due, not to an inherent difference in the nature of the atoms, but to a difference in the number of electrons possessed by the atom. Thus the atomic weight of hydrogen and mercury respectively being one and two hundred, shows that mercury has two hundred times as many electrons as hydrogen.

Thus we are brought to that conception of unity in the material constitution of the universe which the scientific mind is constantly endeavoring to realize. That the electric charge is separable from the corpuscle seems at the present time improbable. Apparently they are one and the same thing.

An atom, or ion, acting as a mass, carries positive electricity, the electrons of which it is composed are negatively electrified. These, under the influence of the electric impulse, are capable of detachment from the parent ion.

In these new views of the matter, ether and electricity, it is readily observed that there is not a perfect unanimity of conception among those who have undertaken to formulate them; yet there is sufficient agreement to furnish a very intelligible mental picture of what is assumed to exist as the ultimate constitution of things. How near the truth they are can only be shown by a larger collection of facts which the discoveries of the future may fairly be expected to supply.

While the atomic theory has thus undergone, in the hands of physicists, an important and revolutionary modification, which tends toward that unification of knowledge which is the ideal of science, it must not be forgotten that it has not been swept away. Matter, in this conception, still acts as if there were units corresponding to the atom, and the doctrine of atomic weights and valences still holds good. Recent discoveries have, however, rendered the atomic theory inadequate to explain and correlate new facts, and have necessitated a modification or restatement.

Similar modifications of view have taken place with respect to the ultimate constitution of matter. Formerly matter was the fundamental reality and ether a supposititious substance invented by physicists to explain certain phenomena that were inexplicable without it. According to the view entertained by the advanced school of physicists matter is only a modification of the ether. Such speculations as these, however, are not wholly recent, and in Professor Dolbear's excellent and stimulating book entitled "*MATTER, ETHER, and MOTION*," published in 1892, will be found language which,

while disclaiming belief in the identity of ether and matter, plainly indicate the trend of thought in that direction long before the startling discoveries of later years had furnished the evidence tending to establish such a probability.

In Cooke's "NEW CHEMISTRY," published in 1881, containing a series of lectures delivered at the Lowell Institute in 1872, will be found language in which, while confessing that he is a partisan of the atomic theory, he distinctly states that he regards the theory only as a "temporary scaffolding around an imperfect building" and "that the tendency of modern thought is to refer differences of substance to dynamic causes."

To this view recent discoveries have given a remarkable support.

(*To be continued*)

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## X-RAY IN CANCER OF THE BREAST.\*

BY EVERETT T. NEALEY, M.D., BANGOR, ME.

(*Read before the Penobscot County Medical Association, Nov. 20, 1906.*)

STATISTICAL facts regarding cancer of the breast are not easily obtainable *per se*. The general opinion among the best authorities, however, is that the cases of cancer of the breast to all others are as about one in four, or twenty-five per cent.

The danger arising from the presence of carcinoma of the breast, as well as the difficulties of dealing with it surgically, are greatly enhanced by the inability of even the most skilled pathologists with the aid of microscope to define the dividing line between the diseased tissues and the surrounding healthy structure. This infiltrating property of carcinoma leads to the rapid involvement of adjacent parts, where skin, fat, mucous membrane, or bone is a very common cause of extension and only too often proves an insurmountable barrier to successful surgical intervention.

The infective property of cancer of the breast is well established by experience in grafting. Therefore great care should be taken by the operator to prevent the surfaces of the wound from being grafted with the disease cells. We ordinarily see recurrence beginning first in the line of scar which means direct infection.

Besides the old and classic method of dealing with cancer of the breast by surgery various methods have been advocated and tried, such as drawing pastes, serum inoculation, cataphoresis, X-ray, and radium. One of the methods, the serum, has been much advocated by Dr. William B. Coley, of New York. But outside of his own hospital the opinion of it seems to me summed up in this remark of Simms, that "from his own experience of the method he could not extract a robust faith in the same."

\*Reprinted from Medical Council



Therefore we will confine our discussion to surgical and X-Ray treatment. The others all have their advocates and are more or less meritorious.

Statistics for cancer of the breast show about thirty per cent of cases cured after surgical operation, that is, all cases in which a recurrence has not taken place at the end of three years. And this applies only when the radical and newer operations are performed early, as is now ordinarily done, by our best operators only.

Watson Cheyne, in England, in 1899 reported sixty-one cases operated upon, and after a period of nine years thirty remained free from recurrence. He claims that from thirty to fifty per cent will recover and remain free from recurrence if the radical operation is performed early. The patient's chance lies in the first and early operation. All others are practically useless, as a recurrence is nearly always fatal.

The average length of life after operation and recurrence is thirty-two months. It is probable that axillary involvement takes place very early in breast cancers. Herbert Snow believes that it begins in two months after the commencement of the disease.

I recently submitted to some well-known leading operators in Portland, Boston, New York, and Philadelphia a series of questions regarding cancer operations. I requested answers from their own experience or the best sources of information. The answers, while varying some, were on the whole quite uniform and very thankfully received in corroboration of the statements and claims I have herein made.

The consensus of opinion was as follows:

*First.*— The cases of cancer of the breast to all others is about twenty-five per cent.

*Second.*— The cures of breast cases by the knife is about thirty-three per cent for three years.

*Third.*— Of the so-called cures, from ten to twenty per cent recur after three years.

*Fourth.*— That an operation by the knife after recurrence results "almost never" in a successful cure.

*Fifth.*— The recurrence when the axilla is involved is from seventy-five to eighty per cent.

*Sixth.*— The average length of life after metastasis or general infection is from one to two years.

The subject of cancer dissemination is somewhat obscure. There are two views as to the process of regional dissemination:

*First.*— Invasion of the pectoral lymphatics occurs by direct cancerous growth along the vessels.

*Second.*— By the cancer cells being swept by the lymphatic stream through the vessels of the pectoral plexus, and metastases are from casual arrest at isolated points. Embolism of the blood vessels alone will account

for metastasis in the internal organs. This method of dissemination is more common in sarcoma than in carcinoma.

Snow believes (London *Lancet*, January 9, 1897) that invasion of marrow of the bone occurs in nearly all cases of cancer of the breast, the humerus being the first bone affected, as manifested after the disease has existed eighteen months by a tenderness on pressure, and sometimes slight thickening may be made out. The result is a firm white marrow.

### *Treatment by X-Ray.*

Results from the use of the X-rays are more far reaching than are operations with the knife. There is no inconvenience, suffering, or nervous shock, as from an operation, if the X-rays are used for treatment.

If the X-ray method is a careful and slow one, so as not to break down the diseased tissues, there is no danger of general infection, but rather a removal of the cause of metastasis in nearby parts. The percentage of cures is larger and the recurrences after three years are smaller when X-rays are used properly.

The scar recurrences in carcinoma of the breasts which have commenced to break down and discharge are not so frequent or early when healed by the X-ray as scar recurrences in insufficiently extensive, early operations by the knife, provided the effect of the X-rays has not by overuse weakened the healthy tissues.

So long as the cancer is confined to the breast and neighboring tissues it can be kept there or cured by the X-rays better than by a surgical operation, which, as we have seen from the opinion of the best operators, almost never cures when we have an involvement of the axilla with recurrence. If, however, the cancer once gets into the blood current it is ordinarily fatal.

W. E. Schmidt shows by his work that cancerous epithelia may fail to colonize in the blood stream, the reason being that the cells excite thrombosis, and the thrombus as it organizes and contracts destroys them. It is sometimes taken care of by the blood vessels themselves.

*Surgical extirpation of the breast is responsible for early metastasis or general infection in a large percentage of cases that thus surely must terminate fatally.*

The chief sources of invasion from surgical interference is through the blood vessels, and this is the most fatal source of general infection.

*The lacteals are greater destroyers of cancer infection than the blood vascular system.*

In lymphatic infection we have more time in which to inhibit by X-ray treatment. The office of the lymphatics is to take up infection, limit the same, and destroy the offending invasion, and unless the glands are overworked, or their vitality weakened and destroyed, they will protect the system from general infection. I frequently see the enlarged and infected lymphatics of

the axilla regain their normal size when protected by a lead covering from the direct action of the X-ray, *showing that they can take care of their contents if the source of infection is withdrawn.*

There is no cure either by X-rays or the knife in cases of general metastatic infection of cancer.

Why is the radical operation of to-day (the so-called Halsted operation) so much in favor? Simply because we get rid of more infected lymphatic tissues than by removal of the tumor alone.

We can certainly take care of this infection more thoroughly and safely with X-rays. Cutting opens up the lymphatics and the blood vessels and admits of ready extension of the disease.

The cancer hospitals of America all claim frequent cures of cancer of the breast by X-ray, but at the same time frequent recurrences. Their records and technique show the overuse of X-rays and consequent weakening of the normal tissues, rendering the same unfit to cope with the malignant growth.

Dr. William B. Coley, of the General Memorial Hospital, of New York City, in his report for the *American Journal of Medical Science*, March, 1906, also Beebe, contributions of the Huntington Fund for cancer research in the same hospital, in their report upon the use of X-rays for treatment of cancer, both agree and claim a most certain and early favorable result from the X-ray. But they claim a recurrence in about the same time as from surgical interference. But their methods were routine and heroic and could only result in the rapid destruction of the morbid growth and the weakening and devitalizing of the lymphatics (and other tissues), the only way provided by nature to prevent the absorption and general infection of the system, and that only so long as these watch dogs remain strong and healthy.

The so-called authorities and authors of X-ray literature have about the same as abandoned the use of X-rays for cure of cancer of the breast, as well as for some other forms.

Many of these men, whose judgment we would naturally rely upon, did not X-ray their own cases, and often depended upon inexperienced operators.

*Such methods as are commonly used are worse than useless; they are criminal.* It is due to this inefficient work by some of our best men that the X-ray treatment has received a most serious setback. Their work was routine and without method. The thing aimed at by them was *to break down and destroy the growth.*

Therein lies the whole secret of their failure. Do not try to get entirely rid of the growth. Try to render the malignant tissue benign. Nature will remove gradually this benign or foreign growth, if you will give her time and not injure the surrounding tissues, which will surely happen if you persist in the treatment, as is done ordinarily. X-ray treatment should continue from about six months to a year or year and a half.

Many of our best X-ray operators have acknowledged to me by letter

the early beneficial effect of X-rays on cancer of the breast. While condemning it largely for operable cases, they almost invariably advise the use of X-rays on inoperable cases.

Why, I ask, are X-rays good for an inoperable case if they are no good for an operable one? They know it is often successful, but why and wherefore they do not know.

The most acceptable theory regarding the action of X-ray upon tissues of the body is as follows: In moderate doses X-rays act upon the general system as a stimulant, inducing a feeling of well-being to the patient, freeing them from much or all of the pain and inhibiting nervous excitement.

Increased doses act upon the intercellular protoplasm of the tissue and gradually inhibit and later break down rapidly growing tissue, like cancer cells of all kinds. The cells after moderate raying have the appearance of starved or slow-growing tissue. They lose their robust growth and fungoid appearance and malignant action upon the surrounding tissues.

Still larger or more frequent doses will in time destroy all tissues, whether pathological or healthy, that come within the range of their influence. Such excessive treatment will undoubtedly force into the lymphatic and blood circulation after they have become devitalized an excessive amount of waste matter, which may produce metastasis by a process of auto-infection.

The above facts have furnished me my reasons for a slow X-ray method in treating cancer of the breast. It has proved far more successful than any other method that has come under my experience. One of the effects of excessive use of X-rays is to inhibit and destroy the lymphatics and blood vessels within and about the malignant growth. This condition is harmful and never called for. It is due to a misunderstanding of the remedial benefits of the agent used.

There are several methods of treating cancer of the breast by X-rays employed and recommended by different operators. Some claim to treat continuously every day or every other day until the growth disappears. Others claim the correct method is by preoperative raying to get rid of outlying cancer cells or affection of the glands; others again say, operate and then X-ray. It seems to me that all three of these methods are bad counsel and equally dangerous in practice, because no man can tell how much preoperative X-ray work has accomplished, and is too likely to curtail his operation to within the danger line. The constant treatment plan is pretty likely to devitalize good tissue and weaken the powers of the lymphatics to protect from metastasis. The post-operative raying cannot be of any great benefit if the operation is extensive enough. I have adopted a technique that so far promises more than either of the other methods because it does not devitalize the glands or destroy the neoplasm, and by a slow but sure change the growth disappears or is rendered benign without total absorption.

*Technique.*—My method of treatment for cancer of the breast is a slow

one, no matter how small or large the growth may be. I invariably use a high tube, with ample energy behind it to give as good a volume of X-rays as possible. I use preferably a sixteen-plate static machine for my source of energy.

At first a treatment is given every other day for a period of ten minutes at a distance of ten or twelve inches from the anode.

The every-other day treatments are continued but a short time, or until I can see that the growth shows signs of loosening from its adhesions, but not long enough to cause a burn or any very noticeable tanning of the skin. I watch for this closely, and when any such appearance is noticed or the growth begins to become movable I stop all treatment for two or three weeks.

Then beginning again, I give about the same strength of raying (sometimes shortening the time of the seance), and repeating once a week, gradually lengthening the time between treatments to once in two weeks or a month. The later treatment is continued until I am satisfied that the growth has become benign.

When the lymphatics are reduced to about their normal size I feel the case is well in hand, and I can thereafter keep up the improvement with very little treatment. Then I shorten the seance and lengthen the period between treatments.

It requires, however, long experience, and sometimes I think almost an intuitive knowledge to judge how much raying to do, or to be able to tell just when to stop work on a case. But that knowledge will come to any careful, observant physician who is interested in the work.

Some well-known operators condemn as "poor practice" the attempt to get rid of a large growth by X-rays alone.

I do not think so, as I have successfully treated cases where the whole breast and axilla were involved, the growth hard and closely adherent. Given time to work and a willing patient of good staying qualities, most cases of breast cancer can be rendered harmless.

The best authorities agree that the recurrences when the axilla is involved (which is very common) are from seventy-five to eighty per cent; also that a second operation in such cases is "almost never" successful.

Provided the X-rays are used early, recurrences in the original region of operation are very much more common from surgical interference than from the intelligent and proper use of the X-ray.

### *Summary.*

What we may expect from the X-rays as compared with the use of the knife:

*First.*— Avoidance of the wear and tear and shock of a capital operation. In cases where a capital operation cannot add more than six to twelve months to a patient's life, it is much better to employ the X-rays, because a longer ex-

tension of life is possible thereby, with much less suffering, if any, and the patient is free from the inconvenience, danger, and shock of the operation.

*Second.*— We get almost complete avoidance of pain from the use of the X-rays and cessation of odor and discharge.

*Third.*— There is less liability of metastasis and infection, for in surgical interference we almost always get a recurrence in the scar, which means local infection. All of my cases of recurrence in the scar have been cured by X-rays, but they are seldom cured by a second or further operation with the knife. There is no danger from general infection from X-ray treatment properly used. All operations, however carefully done, carry a very large percentage of general and local infection.

*Fourth.*— The effect of the X-ray is far more extensive than the most radical operation with the knife.

*Fifth.*— The certainty that we have cured cases with the X-rays that the knife could not cure; also kept in comfort for years, free from pain and disagreeable odor, others who would have died within a shorter period but for the X-ray treatment.

*Sixth.*— By the use of the knife the best operators claim about one third of the cases operated upon remain cured for three years; that ten to twenty per cent of them recur after that time. This leaves about seventy per cent of the cases operated upon to die, for recurrence means speedy death for all that surgery can do to prevent.

Certainly the successful X-ray operators can do better than the surgeons, besides curing some of their recurrences and extending the life of inoperable cases far beyond what is possible by any other method of treatment.

When the axilla is involved, the best operators agree that seventy-five to eighty per cent of the cases recur. Therefore, less than ten per cent of lives are saved by the knife in such cases.

*Positively*, we can beat that record with the X-rays, for the axilla almost always clears up by raying, and we get less recurrence than when the most radical operation is performed.

The average length of life when metastasis occurs after a knife operation is from one to two years, and is not a gratifying result. We are able to show better results from X-ray treatment in all classes of cases, besides curing some cases not possible to cure with the knife. I believe most cases are curable if not gone on to metastasis.

Do not throw down a method because it does not make good in every case. We can never expect by any method to cure all cases of cancer, but that seems to be what is demanded of the X-ray operator, otherwise his method is called a failure. But he can do as well as the surgeon with his knife, who has only within a very few years arrived at a method by which he is able to save even thirty per cent of the operable cases.

Remember also that X-ray treatment is in its infancy as yet, for what the

best operators do not know about their action in all cases would fill a big book. We have accomplished much in a very few years, and are every day learning of better methods of using them than we have heretofore known. And we are curing cases of cancer of the breast in a more humane and comfortable way than by a capital operation. Time alone can tell whether our cures are more or less permanent than the knife.

Some of my patients, whom I have treated for cancer of the breast, have kindly consented to aid me by their presence here to-night to illustrate the results obtained by my method of slowly absorbing and rendering benign the malignant growth by the use of the X-rays.

*Case I.*— The first case which I exhibit to-night came to me in September, 1905. The right breast was thoroughly involved, the axillary glands enlarged, the nipple retracted, the skin adherent, showing a typically malignant case. This case shows the improvement that has taken place since beginning treatment, as you will see it is now difficult to see any growth and the axilla is clear and the arm is normal size. You will also see that there is no sign of tanning or burning; still, we are getting results.

*Case II.*— This breast was solid and nearly all involved, the glands greatly so, the nipple retracted, as you will see. There are two patches of skin where the growth was necrosed and ulcerating. She was in a bad condition and unable to use her arm. There has been a very considerable contraction of the growth, seventy-five per cent at least. This case has been under treatment since April, 1906. The glands are practically absorbed, the ulcer healed, pain has ceased. The swelling and pain in the arm have disappeared and she is now at work every day. The case bids fair to make a good recovery.

What chance would these cases have had from an operation? Could we expect any better results than this? I show these cases merely to illustrate what can be done in a few months.

*Case III.*— This was a growth about the size of a walnut. It was firm and adherent to the skin, which was involved, and now shows the mark of the same. This case was X-rayed nearly three years ago, and has since remained in perfect health.

*Case IV.*— This woman had a growth drawn out three different times in 1904. It was then cut, recurred three months afterwards, when she showed up at my office.

The whole line of incision and the location of stitches were all involved, with recurrence; the axillary glands large and painful, and the scar — the part which was not necrosed — had a blue appearance indicating early ulceration. The arm was nearly useless. The axilla is now clear, the new growth flattened out and whitened, leaving a normal scar tissue. She has had practically no treatment for a year.

*Case V.*— I began treatment in 1902, and I X-rayed this case a few times before operation. In this case the whole gland was involved, as was also the

axilla. I began to get absorption of the axilla before operation. I removed very little of the skin over the growth, as you will see, taking the most favorable chances thereby of reinfection, which I got in the line of the scar, about three months after operation. I again X-rayed it for a few months, when those new growths *nearly* disappeared, as also the glands of the axilla. Her chances from a second operation, according to our statistics, would have been small, and it has been nearly five years since beginning treatment. The small skin growths left are now benign.

*Case VI.*— This breast showed originally a growth of the size of a fist. Axillary glands enlarged and tender. Arm useless. She was rayed the last time three and one half years ago. The growth then was the size of an orange and is now not larger than a walnut. It became hard and steadily decreased in size. The axilla, which was involved, is now clear. She has been able to do her housework with a perfectly well arm, and after the same had been useless for nearly a year.

I have many other cases of like character which, for obvious reasons, I am unable to exhibit, all of which are typified by these exhibited and mentioned above, and are so uniform in their history and action from this treatment as to make me quite certain that I am on the right track in the X-ray treatment of cancer of the breast. All of these fatalities mentioned above were thoroughly infected and had been operated upon one or more times. I think I have proven that a malignant growth may be made to assume a benign character and its malignancy destroyed, and if then let alone will be nowise harmful.

The bugbear of cancer following the use of the X-ray is now taking some prominence in medical circles. It is undoubtedly a fact that cancerous conditions have been known to follow the overuse and destructive effect of this wonderful ray. It simply shows the care and experience necessary in handling this current. But as an offset perhaps we might criticize some of the effects of poor operators with the knife.

If we weaken the healthy tissues by long-continued use, the tissue becomes devitalized and places of growth appear of a mushroom character which resemble cancer, and from the reports of pathologists have the characteristics of cancer, all of which must be due to the overuse of the X-rays and could not be caused by the proper amount necessary to effect cures.

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Remember,

To do your own work well, whether it be for life or death. To help other people at theirs when you can, and seek to avenge no injury. To be sure you obey good laws before you seek to alter bad ones.— *John Ruskin.*

Let us never covet fluency; it is a fatal gift. Let every man covet eloquence. It is to speak the right thing at the right time, in the right way.— *Frederick W. Robertson.*



# DEPARTMENT OF DIETETICS

## FRUITS — THEIR NUTRITIVE USES.\*

BY HARVEY W. WILEY, M.D., PH. D., WASHINGTON, D. C.

**DEFINITION.** Under the term "fruit" is included the edible products of many trees and shrubs. As it will be used here, it is applied to the class of orchard products represented by apples, peaches, pears, etc.

**GENERAL CHARACTERISTICS OF FRUITS.** The general characteristics of fruits include their color, flavor, odor, and nutritive properties in so far as we are concerned with them in this manual. They are composed very largely of water, perhaps eighty per cent or more. The solid matter consists of the usual cellulose structure of vegetable bodies, sugars, gums, organic acids, and mineral matters. Fruits are all succulent, that is, by reason of their high content of water, composed chiefly of matters in solution which constitute their juices. All fruits, therefore, when subjected to pressure yield a juice which contains the principal portion of their dietetic constituents.

The study of the composition of the fruit juices would, therefore, naturally accompany a study of the fruits themselves. The chief characteristics of fruit from a dietetic point of view and also a palatable standpoint are their sugars and acids. The characteristic of taste depends on these two constituents principally. In addition to this, the fruits contain aromatic substances belonging to the class of essential oils and compound ethers which give to them the agreeable odor which adds so much to their value.

The sugars in fruit include both the common sugar (sucrose) and invert sugar, which contains equal quantities of dextrose and levulose. As the sugar is more or less abundant in proportion to the other ingredients the fruit is more or less sweet. The different fruits contain different quantities of sugar,—the richest, perhaps, is the grape, which often, in a state of complete maturity, may have from twenty-five to thirty per cent of sugar. Apples contain from five to fifteen per cent of sugar, and peaches and pears somewhat less. In fact this range in sugar will cover nearly all the fruits, large and small, as well as most of the berries. One of the most important constituents of fruit from a palatable point of view is found in its organic acids. These vary in different classes of fruits. The most common organic acid in fruit is malic, which is the chief acid in the apple and allied forms. In citrus fruits, such as the lemon and orange, citric acid is the principal organic acid. In grapes the principal organic acid is tartaric. More than one of these acids

"Foods and Their Adulteration." Published by P. Blakiston's Son & Co., Philadelphia, Pa.

is, however, usually contained in a single fruit, and other organic acids than those named are found in small quantities in various fruits. The three mentioned may be regarded as the typical acids in fruits. These acids, if prepared chemically and administered in a pure state, have practically no food value at all, and cannot be considered as wholesome material to place in the stomach. When, however, they are eaten in their natural state in combination with the potash and other bases which fruits contain, and mingled, as Nature has done, with the other constituents, they add not only to the palatability but also to the wholesomeness of the product. This is only another illustration of the fact that natural products are often wholesome and desirable where artificial products of the same kind chemically are hurtful and undesirable. Many fruits contain considerable quantities of a carbohydrate allied to some extent in its composition to sugar and starch but which has the property of setting to a semi-resilient mass known as jelly. This constituent in fruit is known as pectin or pectose, and is present in greater or less quantities in almost all fruits. It is by the utilization of this component of fruit that the jellies which are so common an article of food are prepared. While in its physical properties the jelly of fruits has some resemblance to the gelatine or jelly of animals, its chemical composition and nutritive values are entirely different. The gelatine or jelly of animals is essentially a nitrogenous product, while the pectin or jelly of fruit is essentially a carbohydrate product. The two, therefore, are not to be confounded.

**NUTRITIVE USES.** The edible fruits are not only valuable on account of the nourishment they contain, but particularly so because of the general effect which they have upon the digestive operations. Their judicious use is conducive to health in many ways, the fruits are mildly laxative, as a rule, although there are some exceptions to this. For instance, in some berries, like the blackberry, the quantity of tannin present is sufficient to cause a styptic or binding action. While all the fruits contain tannin it is usually not in such proportions as to produce a constipating effect. On the other hand the combination of the acids, bases, pectins, and sugars favors a free and natural progress of the food through the alimentary canal. The entire withdrawal of fruit from the dietary, even if the nourishment it supplies be provided in some other way, would work great damage to health. There are certain dangers, however, to be avoided in the general use of fruit. Immature and imperfect fruits are unwholesome. Fruits are often subjected, moreover, to infection with eggs of various kinds of insects, and these organisms and the larvæ or eggs thereof may be introduced into the stomach with more or less injurious effects. In the eating of fruit care should be exercised in the inspection and proper preparation of the article; it should be free from infection, decay, and insect life. The natural condition in which fruit is eaten is in the raw state, and in general it may be said that this is the more wholesome and preferable way of eating it. On the other hand the cooking

of fruit sterilizes it and makes the consumer secure against any infection from bacteria and insect life, and in some ways promotes to a certain degree the digestive processes. This is especially true of fruits of a hard or unyielding nature. Cooked fruits, as a rule, may be considered less desirable than the natural article, but they deserve mention on account of their freedom from infection, wholesomeness and general dietetic value. Some fruits, such as apples and pears, contain notable quantities of starch, especially in the immature state, and this disappears to a greater or less extent during the process of ripening. At the period of complete maturity the starch is reduced to a minimum and the sugar in the fruit reaches a maximum. After this period the fruit begins to lose in dietetic value, due to the natural process of decay, which is not even entirely checked by placing the fruit in cold storage. The sugar gradually ferments and disappears. The fruit becomes more spongy and less palatable and its general properties are impaired. Other fruits, such as the orange and lemon, berries, etc., contain little or no starch at any period of their growth. By careful storage the period of maturity may be prolonged for weeks or even months, and thus the fruit made available over a very much longer period than would otherwise be the case. Under the existing conditions of communication with all parts of the world it is not impracticable for even those who are not blessed with wealth to have a daily supply of fresh fruits grown in different parts of the world. In temperate climes fresh fruits are available from June until May of the following year, either furnished directly from the orchard or properly preserved by storage.

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### USES OF MINERAL WATERS.\*

BY ROBERT HUTCHINSON, M.D., LONDON, ENGLAND.

WHAT dietetic advantages are obtained from the impregnation of water with carbonic acid gas? Apart from the pleasant, sharp taste which such water possesses, one finds that carbonic acid gas is an undoubted aid to digestion. Indeed it may be said that the mineral waters stand alone among beverages, in that they actually promote the *chemical* processes of digestion by causing an earlier and more abundant secretion of gastric juice. Not only is this the case; carbonic acid acts as a stimulant to the movements of the stomach, and so aids the mechanical processes of digestion also, while the bubbling up of the gas through the stomach contents doubtless facilitates their disintegration.

There are cases, however, in which such waters should be avoided. Carbonic acid gas is rapidly absorbed from the stomach into the blood, and where that fluid already contains an excess of the gas, as it does in cyanosis,

"Food & Dietetics." Published by Wm. Wood & Co., N.Y.

it may be well not to run the risk of adding to it. The mechanical distention of the stomach, too, which the escape of the gas induces, may be harmful in dilatation of that organ, and in other cases may hamper a weakened heart by causing the fundus of the stomach to press up against it. The use of mineral waters should also be avoided in cases in which the appetite is much depressed, for the carbonic acid gas, by lowering the sensibility of the stomach nerves, may still further impair the desire for food.

Unfortunately, it cannot be justly claimed for the aerated waters that they are always sterile. Carbonic acid gas is *not* fatal to organisms, with the exception, perhaps, of the cholera bacillus. On the other hand, the mineral waters supplied by the best makers are usually prepared from water obtained from artesian wells, and on that account are likely to be free from the germs of disease. The distilled aerated waters are also beyond reproach in this respect, but they should not be taken in large quantities unless along with food, for there is reason to believe that distilled water may have injurious local effects in the stomach, and lead to nausea and vomiting, by destroying its surface epithelium.

The question of *natural versus artificial mineral waters* must be decided entirely in favor of the former. For one thing, the natural waters do not contain any excess of gas, and a larger proportion of what they do contain is present in a combined form than is the case with the artificial waters. Hence their gas is given off more slowly, and they remain longer brisk, and are less apt to lead to sudden distention of the stomach. The following experiment bears this out:

NATURAL WATER		* ARTIFICIAL WATER	
Gas evolved .....	480 c. c.	.....	760 c. c.
Gas remaining .....	1,010 c. c.	.....	723 c. c.
Total .....	1,490 c. c.	.....	1,483 c. c.

\* Bottle opened and exposed for half an hour.

There is also reason to believe that the effects of the salts in natural mineral waters are such as cannot be obtained from any artificial imitation of them. The reasons for this have been discussed by Koeppel. He attributes it to the fact that the natural waters contain *traces* of many salts which are not present at all in the artificial waters, and which are yet not without effect on the body. Being formed under pressure, too, the natural waters contain double salts, the physical effects of which are not comparable to each salt taken separately, for each salt has its own partial pressure, while, for any given degree of concentration one finds fewer dissociated "ions." This is not without influence on the physical processes of osmosis, and as a matter of fact it has been found that more mineral matter is absorbed in a given time by the intestine of a dog from a natural than from an artificial water.

The slight alkalinity of some of these waters renders them useful additions to the more acid wines, for the inhibitory action of the latter on the

saliva is thereby corrected. The sweetened mineral waters, such as lemonade, are apt to disagree with the stomach and produce acidity, both by reason of the acid which they contain, and also from the action of their sugar on the secretory processes in the stomach, and perhaps also by fermentation. On the other hand, it must be remembered that such beverages are by no means devoid of nutritive value, for a bottle of one of them contains sugar enough to yield nearly one hundred and fifteen calories of energy to the body; and their refreshing influence in fatigue may also be explained by reference to the value of sugar as a food in exhaustion.

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### DIET IN TONSILITIS AND QUINSY.\*

THESE diseases require no special care in the acute stage, beyond giving food in such fluid form as can be most easily swallowed. The pain caused by this act is often so extreme that it is advisable to concentrate all food, to lessen the number of necessary acts of deglutition. Meat juice, peptonoids, beaten eggs and brandy, may be added to good milk. Plain vanilla ice cream may be given. Its coldness is sometimes soothing to the pharynx.

Holding cracked ice in the mouth before swallowing will sometimes annul the pain momentarily, or in extreme cases the pharynx and tonsils may be sprayed with cocaine, and the period of temporary anæsthesia may be utilized for swallowing considerable nourishment.

This is rarely necessary, for unless the patient is emaciated by previous serious illness, he is not apt to be in need of much food for a day or two. In bad cases of suppurative tonsilitis, the strength suffers more, and stimulants may be given by the rectum if deglutition is impossible.

After all forms of tonsilitis there is apt to be considerable anæmia, and the patient for a week or two should eat abundantly of animal food. Egg-nog and milk punches are often needed for the first few days of convalescence.

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### TAKE NOTE.

Beginning with the April issue, "The Electro-Therapeutist," formerly published by H. C. Bennett, M.D., of Lima, Ohio, will be consolidated with "Albright's Office Practitioner," Philadelphia. There will be no change in the title, policy, or management of the latter journal, the only change being an increase of the number of pages.

\*W. Gilman Thompson, M.D.: "Practical Dietetics." D. Appleton & Co., N. Y.

# EDITORIALS

## Journal of Therapeutics and Dietetics

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PITTS EDWIN HOWES, M.D., Treasurer

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PITTS EDWIN HOWES, M.D., EDITOR.

JAMES MARSHALL FRENCH, M.D., ASSOCIATE EDITOR.

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### PHOSPHORUS.

LARGE amounts of phosphorus cause violent inflammation of the stomach, intestinal pains, vomiting, and death. In cases of phosphorus poisoning an emetic of sulphate of copper in 3 gm. doses every few minutes is very effective.

Phosphorus is a very powerful general stimulant and nerve tonic, and is exceedingly efficacious in diseases that are attended with great lack of vitality. It bears a somewhat similar relation to the nervous system that iron does to the blood.

It is also an excellent tonic for strengthening the sexual appetite and for remedying the sexual weakness. In the treatment of diseases arising from sexual abuse, such as involuntary seminal emission, phosphorus, when used with salix nigra arments, is a most valuable remedy.

In many troubles, too, of a nervous character,—more especially when attended with pain—such as long-standing cases of neuralgia that have resisted other methods of treatment, phosphorous is a most excellent remedy, and as a stimulant its influence is remarkable.

In cases of this nature I use the following prescription:

R Hom. Tinct. Phosphorus	℥iv
Spec. Med. Nux Vomica	℥j
Oil Celery Seed	℥ij
Alcohol, q. s., a. d.,	℥iv

Medicate the large homeopathic sugar disks with this tincture, giving them as required. This method will be found much more convenient than giving the remedy in solution. I am strongly inclined to think that we have not sufficiently appreciated this drug — phosphorus — and applied it to those conditions for which it is most certainly curative.

In those cases which come to us tired out, run down, with brain fog, — a condition approaching paralysis — we have not a remedy that will give us better results than the free phosphorus combined with the nux and celery.

Another combination which will relieve many neurasthenics is the following:

Lloyd's Phosphorus	gtts. x
Spec. Med. Ignatia,	gtts. x
Spec. Med. Cactus,	gtts. xv — xx
Aqua,	℥iv
Mix. Sig. ℥i to be given after each meal.	

This will be especially useful when the patient cannot assimilate the iron preparations.

### THE INDICATIONS FOR THE REMEDY.

DID you ever note how often it is the case that one man will have remarkable success in the use of a certain drug, while another man equally capable will fail utterly to obtain any good results from it? My friend told me with enthusiasm of his wonderful results with a remedy which was new to me. I had all confidence in his judgment and skill, and went home to try it in my own practice. It was a failure in my hands, and to this day I am unable to use it with any degree of satisfaction. I turned the tables on him, and gave him a glowing account of one of my favorite remedies, which he tried faithfully and reported as a flat failure with him. Now these drugs were the same in one man's hands as in the other's, and if used in the same way and in the same conditions, would produce the same results. The difference was, that one man had learned by the slow and careful processes of experience, how to use the drug so as to get results. The other jumped at the broad outlines which were held up to his view, and made haste to use it in cases to which it was not adapted, and pronounced it a failure because it did not do what he wanted done — but which in the nature of things never could be done by that drug under those conditions. The one man has learned the indications for

the remedy, the other has not. The name of the disease has little to do with the right use of remedies. Drugs are not specifics for the names of disease, though they may be for particular diseased conditions. Success in the use of remedies depends on determining, first, the exact condition of disease, and secondly, the exact action of the remedy. In other words, it depends on knowing the indications for the remedy.

J. M. F.

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### TO LENGTHEN LIFE.

A WISE old divine once gave this recipe for lengthening life: "*Have an incurable disease, and take care of it.*" This rule is not by any means to be sneered at. There is a world of wisdom in it. The man who has an incurable disease, and takes care of it, must needs have learned his limitations, and the necessity of keeping within them. He knows how much work he can do in a day, and he does not undertake to do more. He has found out that his stomach is not made of cast iron, and that it pays to show it some mercy. He is obliged to give careful attention to the laws of health, otherwise he would not be able to live at all. Experience has taught him that when he is taken ill, the wisest thing that he can do is to give up work at once, and make a business of getting well again. And when once he is restored to health, he makes it his chief business to keep well.

The man who is seldom ill does not understand the need of taking care of himself, and has never learned to practise it. He does not know what sickness means, and is not prepared for it when it comes. If the doctor does not cure him in a single day, he is very likely to be discharged, and another one employed to go through the same process the next day. Even when he really gets down sick in bed, he is not willing to let himself be properly taken care of, but since he is uncomfortable himself, he is not satisfied until he makes everybody else uncomfortable too. Altogether, he is much more liable to die of a disease which ought to be curable, than if he had been early trained in the ethics of the sick room, and knew how to be sick gracefully.

It is a common thing to learn of noted men, and especially of literary men, that in their boyhood they were sickly and feeble, but as they grew older they outgrew their youthful weaknesses, and became comparatively strong and enduring. On the other hand, many of our best workers, when they are gone, are found to have been for years in the grip of some incurable disease, which they held down with bit and bridle, doing good work and filling honorable positions for years, and only yielding when yielding was inevitable. They were obliged to take care of their disease, and in so doing, they learned to take care of themselves.

J. M. F.



## THE PERSONALITY OF THE PHYSICIAN.

OF all the conditions which tend to hasten or retard the recovery of the sick, few are of more importance than the personality of the physician. If this is such as to inspire confidence on the part of the patient and his friends, and insure obedience to his directions, it will prove a powerful aid to nature in relieving suffering and hastening the return of health in all curable cases, and of smoothing the way down the hill of life in those which are in their nature incurable. If the reverse of this is true, then but little can be expected in the way of good results. So well is this fact understood, that the physician who finds that he has lost the confidence of his patient is universally considered to be lacking in the proper professional spirit, if he does not promptly throw up the case. When a patient has full confidence in his physician, though every drug and direction be the same, yet the results obtained will far surpass those to be seen when he fails to trust him.

If you will recall the successful physicians of your acquaintance, you will find that their personality has been an important element in bringing about their success. Sometimes this personality is a thing which is manifest in the manner of the man, and then it aids in bringing him early success. Again it is a matter wholly of character, and lies deeper than the surface. It may even be found along with a manner which does not give a favorable impression at first sight, occasionally with one which is distinctly unpleasant. Such men gain the confidence of their patients by their character and ability in spite of an unfavorable manner. At the bottom, it is the manhood of the man that tells the story.

J. M. F.

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## BOOK REVIEWS.

*The Elements of Homeopathic Theory, Materia Medica, Practice and Pharmacy.* Compiled and arranged from Homeopathic Text-books, by DR. F. A. BOERICKE and E. P. ANSHUTZ. Second revised edition, 218 pp., cloth, \$1.00 net; postage, five cents. Philadelphia, Boericke & Tafel, 1907.

It is difficult to understand how any more information on the above subjects could be crowded into such a small compass. To those who wish to know more about the homeopathic treatment of disease this little work can be most heartily recommended.

Without doubt the earnest seeker after truth along medical lines will be stimulated by this book to delve still deeper into the subjects upon which it dwells. Therapists of the near future will garner their facts from all sources.

*Food and Diet in Health and Disease*, by ROBERT F. WILLIAMS, M.D., Professor of Practice of Medicine in the Medical College of Virginia, 392 pp., cloth, \$2.00 net. Lea & Febiger, Philadelphia and New York.

The correct method of adjusting food to both the healthy and diseased person is demanding more and more the attention of the progressive practical physician. Many times the correct diet is the turning point between success and failure in the removal of abnormal conditions. Dr. Williams has gathered a vast amount of information along these lines in his work on "*Food and Diet in Health and Disease*." It deals largely with *the essentials* and so makes it extremely useful for rapid consultation.

*Confessio Medici*, by the writer of "*THE YOUNG PEOPLE*." 158 pp., cloth, \$1.25 net. The Macmillan Company, 66 Fifth Avenue, New York City.

Although the writer of this book has seen fit to withhold his identity, yet the work is none the less interesting. Possibly the best key to the contents of its pages may be found in an extract from the preface: "Here is no confession of sins and errors, no disclosures of secrets, no mention of names, no memory of offense, no airs of penitence. I neither ravel out my weaved-up follies nor complain that I wasted Time, and now doth Time waste me. Even if it were true, I am not minded to talk in that silly way. I only want to confess what I have learned, so far as I have come, from my life, so far as it has gone." All who turn its pages will enjoy them.

*Practical Diagnosis, the use of Symptoms and Physical Signs in the Diagnosis of Disease*, by HOBART AMORY HARE, M.D., B.S., Professor of Therapeutics in the Jefferson Medical College of Philadelphia; Physician to the Jefferson Medical College Hospital; one time Clinical Professor of Diseases of Children in the University of Pennsylvania; Laureate of the Medical Society of London, of the Royal Academy of Medicine; Author of a Text-book of Practical Therapeutics and a Text-book of the Practice of Medicine, sixth edition, thoroughly revised and enlarged. Octavo 616 pp., 203 engravings, and 16 full-page plates. Cloth, \$4.50 net; leather \$5.50 net. Lea & Febiger, Philadelphia and New York.

The popularity with which this work has been received is well attested by the fact that six editions have been rapidly called for by the medical profession. Without doubt this is due largely to the practical and helpful character of its contents.

The author enables the reader to see his patients, as they are seen in actual practice, and helps him to correctly elucidate the variety of symptoms that are constantly being presented for his unravelling. It is a book which should not only find a place in every medical library, but one which ought to be carefully studied and its vast fund of knowledge utilized.

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## LOBELIA.

"LOBELIA has not been used much of late, owing to the impression that it is poisonous. Still, other drugs, such as arsenic, strychnine, and aconite, are valuable, and if used discreetly will give relief in many diseases. Strychnine is a valuable tonic, aconite acts well in fevers, and arsenic is a specific for skin diseases. Lobelia is of value as a tonic emetic, but acts slowly on the liver and kidneys. The dose is five drops in water every three hours."

The above extract was taken from among the "gleanings" in the April issue of the Medical Summary, and is taken as a text to preach a little sermonette on the necessity of being broadminded when making statements concerning the action of some of the most common drugs. There is no question but that lobelia is a tonic emetic, and that if it was used in that capacity more frequently our patients would be the gainers thereby. I do not believe, however, that such an effect would be produced by giving gtts. v of lobelia in water, once in three hours. In order to get the best results from this drug as an emetic it should be given in small doses — the fraction of a drop — in tepid water every ten minutes until the system becomes saturated with the lobelia when the single large dose — gtts. v — x, — given in warm water, will produce an emesis that not only empties the stomach but removes much of the effete material from the blood.

To those who have studied the action of this remedy and have made much of any use of a reliable preparation, the emetic action is one of the minor uses of this reliable remedy.

One of the most frequent demands for the use of lobelia is where your patient complains of difficult breathing. The small dose of this drug, one sixth to one third of a drop in a teaspoonful of water, and repeated every fifteen minutes to every hour, according to the severity of the case treated, will almost invariably relieve this distressing condition and render your patient more comfortable.

If you once use lobelia in this manner you will never forget its helpfulness and it will be sure to become more and more a tried friend.

This is only one of many uses of the minute dose, all of which are equally commendable. Others will be alluded to in subsequent items. One caution is necessary, however, to get the best result from the small dose it is advisable to use a preparation which is made from the seed. For an emetic you should use the remedy made from the plant.

# DEPARTMENT OF THERAPEUTICS

## DRUG STUDIES.

### LYCOPUS VIRGINICUS.

#### A PRELIMINARY REPORT.

BY J. M. FRENCH, M.D., MILFORD, MASS.

**BOTANICAL CHARACTERISTICS.** *Lycopus Virginicus*, natural order Labiatae, common names, Bugleweed, Water Bugle, Sweet Bugle, Water Hoarhound, Gypsy Weed, Paul's Betony, Green Ashangee, and Archangel, is an indigenous, perennial herb, having a fibrous root and a straight obtusely four-angled stem, with the sides concave, often with small, slender runners from the base, and growing from ten to twenty inches high. The leaves are broad lanceolate, serrate, tapering, and entire at both ends. The flowers are very small, and appear in dense axillary clusters. This plant somewhat resembles the mints but lacks their aroma. It is common in bogs and moist, shady places throughout most parts of the United States and Canada.

**MEDICAL HISTORY.** *Lycopus* was used as a medicine early in the nineteenth century, at which it is mentioned by Schoepf, Ives, and Zollikofer. In 1828 Rafinesque gave an excellent account of its introduction into medicine. He describes it as an excellent sedative, subtonic, subnarcotic, and subastringent. He mentions it as partaking of the properties of digitalis, sanguinaria, cimicifuga, and spigelia; but as neither diuretic nor anthelmintic, but rather one of the mildest and best narcotics in existence.

Drs. Pendleton and Rogers, of New York, were among the first to investigate the properties of bugleweed, and they reported several cases of hemoptysis and insipient consumption as having been cured by it. In New Jersey it was used in Rafinesque's day as a remedy for diarrhoea and dysentery.

*Lycopus* was introduced into homeopathic practice by Professor E. M. Hale, who first used it on the recommendation of an eclectic physician in a case of incipient phthisis. It is now employed to a considerable extent by the homeopathic branch of the profession, but its development is due almost entirely to the eclectics, and until recent years it has scarcely been mentioned by the regulars.

**CONSTITUENTS.** It contains a volatile oil, a bitter principle, tannic and gallic acids, and some other substances, variously estimated by different investigators.

**PREPARATIONS AND DOSES.** The whole herb is used in infusion or decoction, and there is a fluid extract, the dose either of the herb or the fluid extract varying from one dram to half an ounce. The dose of the eclectic preparation, specific lycopus, is from one to twenty minims. The concentration, lycopin, is prepared both in powder and in the granule form, the dose being from one half to one grain before meals and at bedtime. The standard granule of the alkaloidists contains one sixth of a grain.

**ACTIONS AND USES.** *Lycopus* is a neurotic, producing its effects principally through the sympathetic system of nerves.

Its principal sphere of action is the thoracic and abdominal viscera.

The nature of its action is that of a sedative, mild narcotic, subastringent and tonic.

It acts on the heart as a sedative, constricting the blood vessels and lessening the flow of blood. Its effects are most marked and satisfactory in those cases where the vascular action is tumultuous, the pulse rapid, and the heart weak.

In diseases of the respiratory organs it is used with good results in incipient phthisis, hemoptysis, and irritable cough. It lowers the temperature, lessens irritation, and allays the distressing cough.

Scudder says that *lycopus* will be found to be a very valuable remedy, and will take its place with *veratrum* and *aconite*. It is a certain sedative where increased frequency is dependent upon want of power. For this purpose he employs it in all forms of acute disease where there is great debility. No remedy is more certain in its action in these cases; and he finds that as the pulse is decreased in frequency it is increased in strength, and there is a more regular and uniform circulation of the blood. The remedy, he continues, evidently acts upon the sympathetic system of nerves, and we have not only an improvement in the circulation, but every vegetative function feels its influence. Thus it improves the appetite and blood-making, nutrition, and secretion. It has been employed more extensively in the treatment of hemoptysis than in any other disease. In these cases its action is very slow but very certain, and its influence seems to come from its sedative action. In this it resembles *digitalis*. Employed in phthisis we find it relieving cough, checking night sweats and diarrhea, lessening the frequency of the pulse, improving the appetite, and giving better digestion. We observe the same influence from the protracted use of *veratrum* in these cases, evidencing the relationship between the remedies.

Shoemaker states that *lycopus* is astringent and sedative. It has been

used in pulmonary disorders and phthisis to allay fever, cough, and expectoration. It reduces the force and frequency of the heart's action, and acts as a sedative, and in large doses is depressant to the nervous system. By virtue of its volatile oil it is somewhat carminative, and in small doses is considered tonic. It has been used in organic and functional heart disease, and in exophthalmus by Dr. Hector. It is of service in spasmodic cough in combination with belladonna, but is rarely used. Probably when its composition and physiological properties are better understood it may be more appreciated.

**SPECIFIC INDICATIONS AND USES.** These are given by Felter and Lloyd as follows:

- (1) Vascular Excitement.
- (2) Hemorrhage, in small amounts, resulting from the determination of blood to the lungs, kidneys, or gastro-intestinal organs.
- (3) Albuminuria, with frequent pulse.
- (4) Cough, with copious expectoration of mucous or muco-pus, especially debilitating chronic cough.
- (5) Wakefulness and morbid vigilance, with inordinately active circulation.
- (6) Frequent pulse, with high temperature.
- (7) Tubercular deposits.

It is also an ideal remedy for the treatment of tobacco heart, according to Dr. S. H. Starbuck, in *Ellingwood's Therapeutist*. Dr. Ellingwood in commenting on the above remarks that this remedy should be studied in the line of its specific field thoroughly and persistently, and we should have more reports from it. It is a very desirable remedy and has certainly been neglected.

I desire to call especial attention to this point made by Professor Ellingwood. The great need in this case, as with a large number of the less-known drugs, is for a more thorough and careful study, not simply or mainly of their physiological actions, but of their clinical effects and applications to be made by a large number of the rank and file of the medical profession, regardless of their school or system of practice. I wish to appeal to those of my brother physicians who are interested in the endeavor to secure greater accuracy and positiveness in therapeutics, to join in the effort to promote so desirable a result by adding their mites to the great sum of knowledge of the action of drugs.

In asking you to test the effects of *lycopus* in your practice, I would suggest the following points to be studied:

- (1) Its action in diseases of the heart, especially in those cases where the vascular action is tumultuous, the pulse rapid, and the heart weak.
- (2) In diseases of the respiratory organs, such as incipient phthisis, hemoptysis, and irritable cough. Here it is said to dry up the secretions

of the respiratory tract without irritating the stomach. It is claimed by some that it does this by contracting the vessels of the pulmonary area. From your experience what is your opinion on these points?

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## A STUDY OF THE TWELVE TISSUE REMEDIES.

BY JOHN WILLIAM FYFE, M.D., SAUGATUCK, CONN.

### NO. III.—CALCAREA SULPHURICA — CALCIUM SULPHATE.

THE remedy here referred to is the sulphate of calcium triturated with sugar of milk.

While this agent is not as frequently indicated as are some of the tissue salts, it often constitutes a medicament of more than ordinary usefulness. It exerts its greatest and most beneficial influence in conditions characterized by purulent discharges from mucous membranes or by purulent exudations in serous sacs. In tubercular ulcers and in abscesses of the intestines it is a remedy of considerable value. In suppurations, when employed at the stage in which pus is being discharged, calcarea sulphurica has been found useful, and in all diseases in which the process of discharge continues too long, and the suppuration is affecting the epithelial tissue, it is used with advantage. Dr. J. C. Morgan says that the sulphate of calcium has an especial action on the connective tissue, and that if there is a deficiency of the salt in any part of the body suppuration is likely to follow. He also says, "The presence of pus with a vent is the most prominent indication for the exhibition of the sulphate of calcium."

Calcarea sulphurica is an efficient remedy in that unpleasant condition commonly known as "scald-head," especially when there is a purulent discharge, or yellow purulent crusts. In the latter stage of ulcerated sore throat, especially when there is a discharge of yellowish matter, it is also of value, and in the suppurative stage of tonsillitis it is believed to be a curative agent of superior merit. Its action in the unpleasant condition which often causes festers, boils, and pimples in many young persons, it is decidedly corrective, and its power of restraining the suppurative process is often of value in healing suppurating wounds.

In croup, when the stage of exudation has passed and the hard membrane has softened, but a tough mucus still accumulates in the throat, it is often useful as a means of removing the mucus and changing the croupous to a catarrhal cough. In ordinary colds, especially when there is a yellowish-green expectoration, or a purulent expectoration tinged with blood, its admin-

istration improves the condition of the mucous glands. In purulent diarrhea, when the stools are mixed with blood, as well as in dysentery, when the discharges are purulent and sanious in character, the sulphate of calcium has frequently proved an efficient remedial agent.

Dr. Betts has found *calcareo sulphurica* useful in extravasation of pus within the pelvic tissues unconfined by a pyogenic membrane, and also as a means of shortening the suppurating process and limiting the discharge of pus. It is deemed an efficient remedy in the treatment of wrongs of the female reproductive organs, and when the menses are delayed or continue an unusually long time, it has been employed with much benefit.

Evidently the sulphate of calcium should receive a much more careful study than has yet been given to it, for even the homeopathic indications which have been published are somewhat vague and uncertain. The following indications, taken from Fyfe's *Modern Materia Medica and Therapeutics*, will suggest the lines along which this remedy may be profitably studied:

"Scald-head accompanied by purulent discharge or yellow purulent crusts; deep-seated ulcers of the cornea; cold in the head, with thick, yellowish, purulent secretion; tongue flabby and resembling a layer of dried clay, with a yellow coating at base; suppurating sore throat; pus-like, slimy discharge from the bowels; purulent exudations in or upon the skin; purulent sores and suppurations."

The dose of the third trituration of the sulphate of calcium is from five to fifteen grains, but its best effects are usually obtained by prescribing it as follows:  $\mathcal{R}$  *Calcareo sulphurica*, 3x, gr. xx to  $\mathfrak{z}$ i; water,  $\mathfrak{z}$ iv. Teaspoonful every hour.

## PHYTOLACCA DECANDRA.

BY PITTS EDWIN HOWES, M.D., BOSTON, MASS.

*PHYTOLACCA DECANDRA*, commonly known as "poke," is a remedy in great favor with those physicians who have sufficiently tested it to know its value.

*Phytolacca* is a handsome plant growing from three to nine feet in height. It is indigenous to all parts of the United States, where it is looked upon as a weed, while in Europe it is highly esteemed as an ornamental garden plant. The part used in medicine is the root and a preparation made from the berries.

The roots should be gathered in the early autumn and their medicinal qualities extracted while they are still green. The berries should be gathered when they are fully matured.



**CHEMICAL COMPOSITION.** The berries have been found to contain phytolaccic acid, gum, sugar, malic acid, and coloring matter.

An analysis of the root shows the following percentage composition: Fatty oil and wax 0.6, bitter resin 1., non-reducing sugar 9.46, reducing sugar 0.4, proteids 1.94, amido compounds 1.6, probably free formic acid 0.36, potassium formate 1.9, starch 11.68, calcium oxylate 6.2, nitrates 2.4, cellulose 16.4, lignin 3.2, gum, coloring matter, ash, moisture 42.75. Edmond Preston obtained an alkaloid from the root, which he named phytolaccine, and N. Coscera found a glucosid.

**ACTION.** *Phytolacca* acts upon the glandular system, especially those glands connected with the throat and sexual system, also upon the fibrous and serous tissues and the mucous membranes of the digestive and urinary tracts.

Inhalation of the powdered root will produce great irritation in the respiratory apparatus.

*Phytolacca* slows the heart's action and lessens the strength of the pulse and the respiratory movements. It is a paralyzer of the spinal cord, spending its principal force upon the medulla. When the dose is sufficiently large to produce death, convulsions of a tetanic nature are very likely to be observed.

Doses of ten to thirty grains will act as an emetic and drastic cathartic; this effect is produced so slowly and with so much discomfort that its use along these lines should not be considered.

Dimness of vision, diplopia, vertigo, and drowsiness are produced by large doses not sufficient to cause death.

**THERAPEUTICS.** *Phytolacca* is classed as an emetic, cathartic, narcotic, and alterative. The first three of these should be abandoned and the medicinal use of the *phytolacca* be limited to its action as an alterative.

Before enlarging upon its therapeutic qualities I wish to emphasize the necessity of always using a preparation made from the green root. To do this I will quote from Dr. Thomas S. Blair, in the article on *Phytolacca* in his *Practitioner's Handbook of Materia Medica and Therapeutics*. He says: "The drug now under consideration is one I wish I had it in my power to adequately present in such a light as to impress not merely the value of the radical differences between green and dried plants in the making of tinctures and fluid extracts. As a matter of fact, no fluid extract of *phytolacca* is of any particular therapeutic value unless made of the recent root in the early fall. A trial of the matter will soon demonstrate this to the satisfaction of any observing man. This is a very useful drug fallen into disuse, like many other good things, on account of vitally defective pharmacy."

These words are true and to the point. One of the important things to do in the awakening to drug possibilities that is beginning to sweep over the medical profession is to insist that all preparations used should be made

in strict accordance with those methods which are best adapted to produce the greatest reliability of drug action. In its alterative action *phytolacca* stands pre-eminent for the effect it produces upon the glands of the throat and sexual apparatus, and should never be lost sight of in any affections of these organs. In tonsillitis, mastitis, and orchitis it is imperatively demanded both as an external and internal medicinal agent.

It is along these three lines that I have made the more frequent use of this drug, and as yet I must say have not been disappointed by its action.

"*Phytolacca* plays an important part in dermatological practice," is the testimony of many who have used it in this class of cases. The condition of the skin which calls for its use is one of 'indolent action, usually associated with vitiated blood.' The glandular system is also affected; generally of a scrofulous nature, although the skin may be inflamed yet it does not itch, owing to its non-activity. In these skin diseases it should be used both locally and internally as in those purely glandular affections before noted. Frequently the addition of *iris versicolor* to the prescription will prove of benefit in conquering some specially obstinate cases.

Ulcerated conditions of the mucous membranes in various parts of the body will be benefited by the use of this drug, especially if combined with *baptisia*.

An extract made from the berries has been used for the reduction of obesity, but as yet little permanent good has resulted from its use.

Almost without exception the writers on therapeutical subjects in the eclectic and homeopathic schools of medicine have praised the use of this drug along the lines above indicated, but with the exceptions of Dr. Blair—quoted above—the old school works on *materia medica* and therapeutics have little to say concerning the usefulness of this drug in the alleviation of abnormal conditions.

Dr. Reynold Webb Wilcox, Professor of Medicine at the New York Post Graduate Medical School, in his last edition of *Pharmacology and Therapeutics*, dismisses this drug with the following words: "*Phytolacca* is an emeto cathartic, acting slowly and causing considerable depression. In large doses it possesses also some narcotic properties. *Phytolacca* is used as a laxative and alterative. Recently a preparation made from the berries—not official—has been used to reduce adipose tissue."

Dr. John V. Shoemaker, in his last edition of *Materia Medica and Therapeutics*, gives the drug a little more extensive notice. He quotes the various diseases where it may be used with advantage, but fails to point out any special reason or indications for its use.

**SPECIFIC INDICATIONS.** "Pallid mucous membranes, with ulceration; sore mouth, with small blisters on the tongue and mucous membranes of the cheeks; sore lips, blanched, with separation of the epidermis; hard, painful enlarged glands; soreness of mammary glands, with impaired respiration,

tonsillar or pharyngeal ulceration; pallid sore throat, with cough or respiratory difficulty; secretions of the mouth give a white glaze to surface of mouth, especially in children; white pultaceous sloughs at corners of mouth or in the cheek; and diphtheretic deposits."

**DOSE.** Fluid Extract gtts. iij—x. Spec. Med. gtts. j—x. Usual Prescription

℞ Phytolacca (Spec. Med.) gtts. x—xxx  
Aqua ℥iv

Mix. Sig. Dose, one teaspoonful every hour.

Ordinary tincture made by percolation from green root should be used in about double the dose of Spec. Med.

For external use the amount of phytolacca should be increased fourfold, and may be used as a gargle, poultice, or moist application, according to the part it is desirable to affect. The addition of a little glycerine to the prescriptions will aid materially in their usefulness.

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## INDICATIONS FOR ACIDS AND ALKALIES.

**General Indications for Acids,** deep redness of tissues, hydrochloric acid, deep redness, contracted tongue and tissues, sordes.

**Nitric Acid:** Deep or rose redness, violaceous haze, not solid in color, but translucent.

**Sulphurous Acid:** Deep redness, tongue furred, tissues full, beefy, gelatinous, dirty glaze, as of spoiled meat; evidence of zymosis.

**General Indications for Alkalies:** Pallor, with whitish coat upon the tongue, Sodium bicarbonate, pallor of tongue and membranes, white or yellowish-white coating on tongue; not putrid, but sometimes sour.

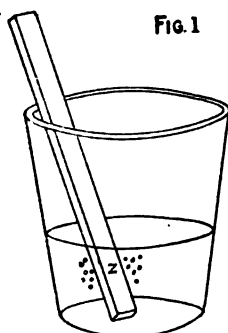
**Sodium Sulphite:** Pallor of tissues, with tongue dirty, pasty whitish coat, of foul odor; zymosis.

HARVEY WICKES FELTER

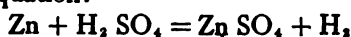
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Be sure that God  
Ne'er dooms to waste the strength  
He deigns impart.

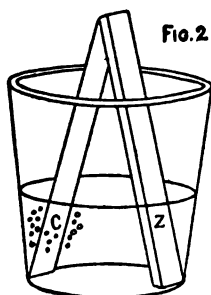
— Robert Browning

**PHYSICAL THERAPY.****FIRST STEPS IN MEDICAL ELECTRICITY.****CHAPTER II.****PHYSICS OF THE DIRECT CURRENT.****By HERBERT McINTOSH, A.M., M.D., BOSTON, MASS.****FIG. 1**

IF a strip of zinc is immersed in a dilute solution of sulphuric acid, a chemical action at once ensues, in which the zinc is attacked by the sulphuric acid with evolution of heat and bubbles and which may be expressed by the following equation:



In this reaction free hydrogen has been liberated, which manifests itself as bubbles rising to the surface, and a salt of zinc formed, namely zinc sulphate, which remains in solution.

**FIG. 2**

If now another substance, as for example copper, be immersed in the same solution without touching the zinc, the evolution of gas ceases; but if the ends of the metals above the surface of the fluid are allowed to touch, a stream of bubbles will now rise from the copper and only a few from the zinc. After a while the zinc will be found to have wasted away, while the copper has remained unchanged.

If now a wire is attached to the ends of the plates above the solution and an ordinary compass is placed under and parallel to them and the ends of the wires are brought together, the needle is immediately deflected at an angle. If the ends of the wires are separated the needle returns to its normal position.

The something which passes through the wires in these simple experiments, and which is a correlative or sequence of the chemical action upon the strips of zinc in the first experiment is by common consent called electricity, the direct current, or galvanism, and is the foundation of our studies in these chapters.

The metal which is most vigorously attacked is called positive, that which is least actively attacked negative. But the end of the wire

attached to the zinc strip is negative, while that attached to the copper strip is positive, because that plate and that end of the wire are positive *from* which the current flows and that plate and that end of the wire are negative *to* which the current flows.

In the experiment above described we showed that something was flowing through the wire by the deflection of the needle. To enable us to determine the direction of the deflection we may employ Ampere's rule, which is to imagine ourselves swimming in the current and facing the needle, in which case the north end of the needle will always be deflected to the left.

An instrument which enables us to detect the presence of an electric current is called a voltameter, and one which enables us to measure an electric current is called a galvanometer. Such an instrument is essentially a permanent magnet so arranged that it can be deflected from its natural position by the passage of a current of electricity through an adjacent coil or coils of wire. If an index is connected with the magnetic needle and made to traverse a graduated scale, we have a means of determining, by reference to a unit previously agreed upon, the amount of the current which is passing

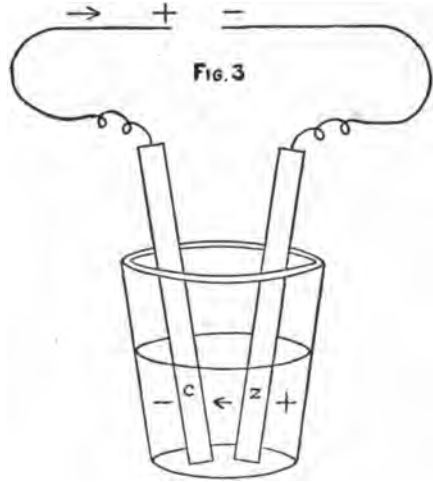


FIG. 4

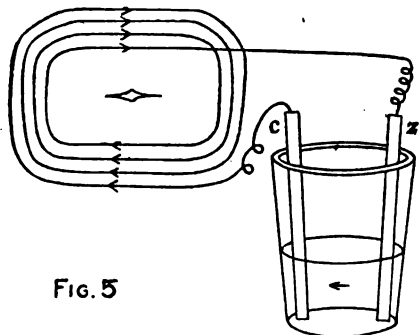
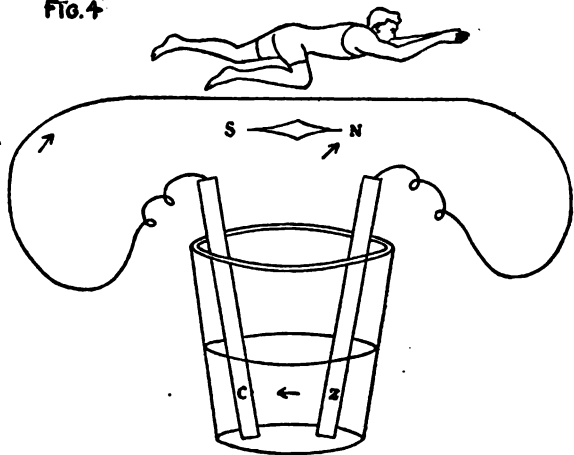


FIG. 5

through the coil. Such an instrument, if graduated in milliamperes is called a milliamperemeter, or mil-ammeter.

By introducing coils of wire of different lengths, different diameters, and different materials in the circuit of a galvanic battery certain very important principles may be deduced:

(1) The strength of current varies directly with the areas of the cross sections of conductors.

(2) It varies inversely with the lengths of conductors.

(3) It varies inversely with the specific resistance of the substances used as conductors.

The power which sets electricity in motion as in a voltaic cell is called the electromotive force, which is abbreviated to E. M. F. or simply E. This varies in different cells, and is dependent upon the nature and character of the substances forming the battery and is independent of the size of the plates and their distance apart.

The unit of E. F. M. is called a volt and is about equal to the current generated by one gravity cell or one Daniell's cell.

To determine the strength of current or rate of flow through a conductor the formula known as Ohm's law is employed. This is: *The current strength is equal to the electromotive force divided by the resistance of the circuit.* This may be expressed as an equation, thus:  $C = \frac{E}{R}$ , in which C stands for current strength, E for the electromotive force, and R for the resistance of the circuit. By transformation this becomes  $R = \frac{E}{C}$  and  $E = \frac{R}{C}$ .

The unit of resistance is the ohm, which is the resistance offered by about one hundred and fifty feet of copper wire one millimeter in diameter, or it is the resistance offered by a column of mercury one meter high and one millimeter in diameter.

The unit of current strength or rate of flow in a unit of time is the ampere. This is furnished by the E. M. F. of one volt passing through one ohm of resistance. That is, using Ohm's law,  $\frac{1}{1} = 1$  ampere; or it is measured by the amount of water the current will decompose into oxygen and hydrogen in one second at 0° C. temperature and 760 millimeters pressure.

The study of the effect of resistances upon the electric current is of extreme importance, and lays the foundation for an intelligent application of medical electricity. We may amplify the above equation  $C = \frac{E}{R}$  by writing it thus,  $C = \frac{E}{ir + er}$ , where  $ir$  stands for the internal resistance, or the resistance of the current in the battery, and  $er$  for the external resistance, or the resistance in the external circuit. In order, therefore, to increase the current we must either increase the numerator or decrease the denominator; and to decrease the current we must either decrease the numerator or increase the denominator.

There are two principal methods of arranging cells to form a

galvanic battery. The first arrangement connects the zinc plate of one cell with the copper plate of the adjacent cell and finally connects the negative of the first with the positive of the last.

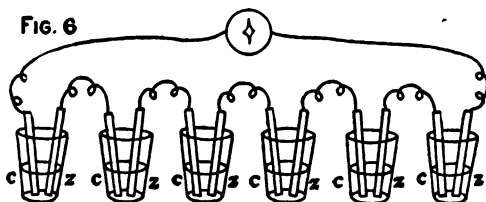


FIG. 6

The second arrangement connects all the positives of several cells with one another and similarly all the negatives, and finally connects the two sets of plates. The first arrangement is said to be in "series," the second in "parallel."

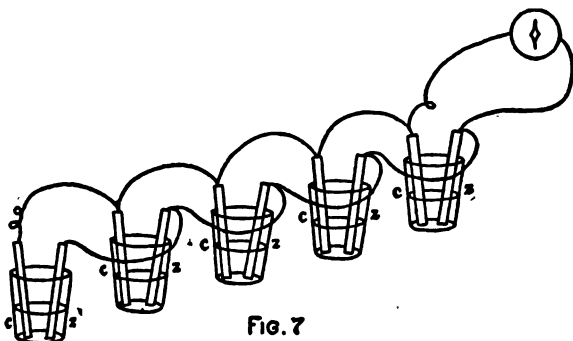


FIG. 7

We are now to determine by a few illustrations what advantages may belong severally to these arrangements.

Assume in the above formula  $C = \frac{E}{ir + er}$  that the E. M. F. is 1, that the internal resistance is 10, and the external resistance is 3,000 (3,000 ohms being the average resistance of the human body). By substitution we thus have  $C = \frac{1}{10 + 3000} = \frac{1}{3010}$ . If we now take twenty cells arranged in series we shall have  $C = \frac{20}{20 \times 10 + 3000} = \frac{20}{3200} = \frac{1}{160}$ .

If now we take the same number of cells arranged in parallel we shall have by substitution  $C = \frac{1}{\frac{1}{20} + 3000} = \frac{1}{\frac{1}{2} + 3000} = \frac{1}{3000\frac{1}{2}}$ .

By comparing the two results the enormous difference between the current effect of these two arrangements is discovered. Though in the latter case the internal resistance is reduced to one twentieth of that in the former, yet, as the external resistance is so large, the reduction in the amount of the internal resistance counts for little.

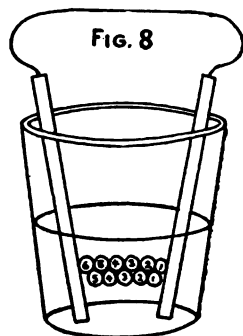
We are thus led to conclude that where the external resistance is large, as in the human body, the proper arrangement of cells is in series. It is evident also that to increase the current it is necessary to make the E. M. F. greater in proportion to the sum of the resistances, and that if the external resistance is great, there is little advantage in decreasing the internal resistance. Thus if we have the equation  $C = \frac{1}{2 + 3000} = \frac{1}{3002}$  we may halve the internal resistance and thus obtain the equation  $C = \frac{1}{1 + 3000} = \frac{1}{3001}$  which gives but a small gain in current; or we may double the E. M. F. and the internal

resistance, and thus obtain the following:  $C = \frac{1 \times 2}{2 \times 2 + 3000} = \frac{2}{3004} = \frac{1}{1502}$ , which is a marked gain.

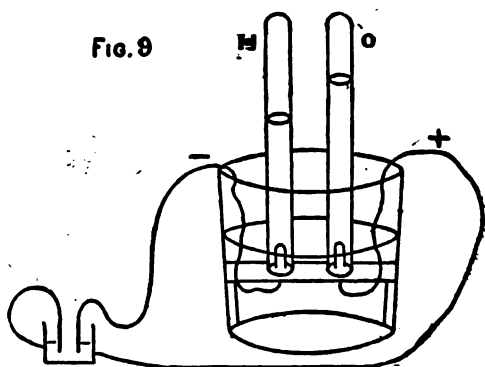
From these illustrations we may draw this conclusion. If we desire to increase the current where the external resistance is large in proportion to the internal, the number of cells must be increased — arrangement in series. If we desire to increase the current where the external resistance is small, the size of the plates must be increased — arrangement in parallel.

This explains why, where the object to be obtained is heat, as in the electro-cautery, where the external resistance is small, the result is best secured by a few cells arranged in parallel.

**"NASCENT" ENERGY.** The term "nascent" is applied to an exaggerated activity manifested by an atom or molecule at the time of its dissociation from the atom or group of atoms with which it was previously combined. In this way it is easy to explain, if we adopt the theory of Grotthus, the appearance of hydrogen upon the copper plate. Thus in Fig. 8, molecule 1 of  $H_2SO_4$  is dissociated, the radical ( $SO_4$ ) uniting with an atom of Zn and forming zinc sulphate. The disengaged molecule of hydrogen being nascent, attacks the molecule of  $H_2SO_4$ , numbered 2, dissociates it and forms the molecule  $H_2SO_4$ , indicated in the circle in the lower line (Fig. 8) numbered 1. The process continues until the copper plate is reached. Thus the hydrogen appearing at the negative plate is not the original molecule dissociated at the positive plate.



**ELECTROLYSIS.** If two test tubes containing dilute  $H_2SO_4$  are inverted over a water-bath and insulated wires terminating in platinum strips are introduced into the test tubes, when the circuit is closed, bubbles of gas immediately arise from the poles and displace the fluid in the test tubes. It will be noted that twice as much gas is evolved in one tube as in the other. The gases, as



can easily be proved, are oxygen and hydrogen, the hydrogen appearing at the negative pole, and the oxygen at the positive. The electrolytic action of the electric current possesses great interest for the student of medical electricity and deserves to be carefully studied.



If the poles of a galvanic battery are introduced beneath the skin for a brief period blisters are formed about each pole. The serum from the vesicles around the positive pole is acid, while that from the vesicles around the negative pole is alkaline. Thus oxygen which appears at the positive pole is by derivation the "acid maker."

*(To be continued.)*

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## LEUCODESCENT LIGHT AS A THERAPEUTIC AGENT.

BY ALBERT C. GEYSER, M.D., NEW YORK CITY.

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WE are constantly making use of the high power incandescent light for therapeutic purposes, and as a consequence many almost incomprehensible recoveries, and even cures, are reported from all over the country. Some of these cures are so diverse in their very nature that it does seem as though a great deal of the psychic element entered into the make-up of either the physician or the patient.

The fact remains, however, that the more this light is used as a therapeutic measure, correspondingly do the cures increase, and those of us who are by nature so constituted that we cannot take anything for granted without knowing the reason therefor naturally stop to inquire, "Why is it so?"

If we desire to make use of any agent, the first duty imposed upon us is to know all about the agent, to know its composition, to realize its indications as well as its limitations.

Light, as we see it therapeutically, consists of three essential elements, namely heat, luminous rays, and actinic power. This is a combination of forces, either of which possesses extraordinary therapeutic virtues, if from a high ampere source and of sufficient power.

Heat has been used from time immemorial for the relief of pain, as a means of causing active hyperemia in parts requiring additional blood supply, for the purpose of removing stasis and so overcoming stagnation and congestion, for the purpose of assisting the metabolic processes, as in

the formation of abscesses and ulcers, and for the purpose of increasing the eliminative function of the skin, etc.

Light rays, distinctively the yellows and greens, give to plant life the chlorophyll which shows a state of strength and vigor. These rays act on the blood supply, increasing the hemoglobin percentage and promoting oxidation; two important considerations in dealing with deviations of metabolism from the normal.

Actinism, or the actinic power of light, is not so well understood, therapeutically at any rate. But if we reflect a moment and define "actinism," we will better appreciate its meaning. Very short, rapid wave lengths, as the violet and ultra-violet, the X-rays, the emanations from radium, etc., have the power to set up very rapid molecular or atomic motion; disassociating or tearing apart, rending asunder; in other words ionizing certain more or less unstable substances, without these substances first passing through the lower rates of motion and becoming heated. Other conditions being equal, the shorter and the more rapid the wave length, the greater is this actinic effect upon atoms without the production of the slow heat motions of molecules. Yet it must be borne in mind that each wave length possesses these qualities in some form or other; for instance, in plants the slower and longer vibrations of the yellow-green or even the red show greater effect, as far as growth and repair are concerned, than the more rapid and shorter blue rays.

Actinism is better understood in chemistry. A photographic plate may contain an emulsion of bromide of silver, which is a very unstable compound. When, therefore, light rays, especially the higher rates, fall upon such an unstable substance, there ensues at once a loosening of the bond of union between the bromide and the silver. We take advantage of this actinic or ionizing power in the arts, and the process is thoroughly understood. Much that holds true in inorganic chemistry also holds true in organic compounds.

As has been stated, we have three direct effects from light, one the heat effect, one from the luminous rays, and the other the chemical or actinic effect. The heat effect is due to the slower and longer rates represented by the red; the luminous or metabolic effect to the intermediate rates, while the chemical or actinic effect is due to the shorter and faster rates found at the blue and ultra-blue and beyond. Between the two extremes are located all the various rates of vibration that go to make up white light. If, then, the combined rates of the visible spectrum are capable of affecting tissue by the creation of heat and chemical effects, what is in store for us if we analyze all the various rates of vibration and select for a particular condition or deviation from the normal, the special rate indicated, or best calculated to change, interfere with, or cause a return to normal?

Ether waves may be so slow and long that our retina is unable to

register them; in other words, the rods and cones do not respond to their rate, consequently do not react to them. Yet these waves travel thousands of miles through the air and at such distances affect mechanical instruments, as in wireless telegraphy. Hertz, after whom such waves are named, showed that their rate is from one half of a million or less per second and they are from one thousand to one hundred and fifty feet apart; yet their speed is as that of light, but they produce neither heat nor light as far as our sensations are concerned.

The next set of waves are those of the infra-red. They are called heat waves because heat is one of their demonstrable factors, yet they are not short nor rapid enough to excite the sensation of light. They are like all waves; stresses set up in the ether by vibratory or to and fro movements of molecules of matter. The more rapid the motion and the greater the amplitude, the higher the degree of recognizable heat. When such waves impinge upon other matter, such as the human body, either the molecules of the body vibrate in unison with them or this arrested motion is transformed into heat, while the heat affects cell metabolism.

If the vibrations are slightly more rapid than either of the preceding, they have the power of influencing the human retina and optic nerve, giving to us the sensation of red. During the next octave, we recognize all the other fundamental colors; orange, yellow, green, blue, indigo, and violet, the middle spectrum having the strongest metabolic influence; the shorter rates of the blue-violet the strongest chemical effect. This entire gamut of color play is exactly as the octave on the piano to the ear. The organs of Corti are so constructed that after the tympanic membrane has been thrown into harmonious vibration with any or several rates, this vibration is conducted by the ossicles to the organs of Corti; these, in turn, vibrating in harmony with the original rate, send their vibrations to the sensorium, where all the different rates are interpreted, as music if in harmony, or discord if not in harmony.

The spectrum with its seven colors could never be interpreted were it not for the fact that our rods and cones can respond to their various rates of vibration and fall into harmony with them. Even that would be insufficient were it not a fact that the cells in the sensorium must also vibrate in unison with the original rate before a certain color can be distinguished.

We not only possess these cells endowed with that property, but *every cell in the whole human body is capable of being thrown into certain rates of vibration as soon as the exciting agent is strong enough and long enough continued.* When, therefore, from any source, either external or internal, a cell or cells, or even one of the component parts of a cell, is thrown into a rate of vibration that is not in harmony with nature, then there is discord in that cell and that discord affects neighboring cells. As soon as a sufficient number of cells are vibrating in discord we recognize this condition as disease.

This diseased condition may assume a hundred or more forms and appearances, and according to the particular manifestation we label that disease and give it a name. *Yet, after all, we are simply dealing with one of only two possible conditions; either some cells or their components are vibrating too fast and so become hypernormal, or they are vibrating too slow and so become subnormal.*

The ear, as we know, responds to nearly all the rates which are found in eight octaves, while the eye can respond to only one octave, but there is no doubt but that there are some animals so constructed that they see in what appears to us as utter darkness, or that they make and hear sounds that no human ear ever heard. Such rates, shorter than the violet, fail to excite the retina, therefore the ultra-violet and the X-rays are invisible to us, yet we know that great chemical power resides in these rates.

In a paper, "The Sensations of Insects," Paris, 1902, Forcel states that he has found that ants can distinguish the ultra-violet rays of light and they seem painful to them. This again proves that these rates of vibration do affect even such small cells and organs as those of the ant.

A mass of white-hot steel or iron gives out all rates of vibration, and if brought into close enough proximity to any other metal, will cause that metal, if capable, to assume the same rate of vibration as the original iron. We know from actual experience that all rates of vibration, no matter how produced, which we call light waves or rays, impinging on a body, will set its molecules in motion, at first slowly and then more and more rapidly, until they eventually would cause the same rate of vibration as they themselves possess. The more rapid the rate of vibration, the greater the actinic or destructive effect. The X-ray, therefore, is the most destructive of the higher attenuations of vibration known. The slower the rates the more tonic is the effect. When, therefore, a cell or organ is over-active, the blue, indigo, violet, or X-ray is certainly indicated, while, on the other hand, if a cell or group of cells is subnormal, then green or yellow are the rates to select.

The pure white light possesses all the colors of the rainbow or the spectrum. In other words, white light is an octave with all notes vibrating at once and in perfect harmony. Is it any wonder, then, that the application of such rates, if of sufficient amplitude, would affect such a multitude of diseased conditions and restore them to normal? On the contrary, the real wonder lies in the fact that this system of therapeutics has remained so long in the dark. As soon as the physician can emancipate himself and realize that it is not the agent, but the response that the body is capable of making to the application of any agent indicated, then indeed light, and other physical agents, will receive their just recognition.

Living means nutrition; nutrition means chemical changes, and chemical changes mean an electric current setting up vibratory changes in the tissues. Whether the electric current sets up waves of motion in the ether,

as the Hertzian waves from a static machine, or high tension coil, or the production of vibrations which appear as red, orange, yellow, green, blue, indigo, violet, or X-rays, does not matter. Every motion, every rate of vibration, is either indicated or contraindicated in diseased conditions. It is in the wise selection and choice of these rates that the physician plays the greatest role.

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## THE THEORY OF ELECTRIC TREATMENT.

BY CHARLES E. BUCK, M.D., BOSTON, MASS.

MUCH has been said and more written relative to the efficiency of electric modalities, in the treatment of pathological conditions, and when one attempts to form an opinion, by what he reads or hears along these lines that shall be at all just, he finds himself in the midst of a medley of views at once complex and confusing, and it is not strange that he abandons the task with feelings of utter helplessness.

There seems to be no class of agents that the physician can call to his aid in combating disease, the value of which depends so completely on the varied skill and temperament of the one administering them as does the several forms of this natural remedial influence.

In all therapeutic procedure one to be successful should have at least a fairly definite idea of what he wishes to accomplish with the patient, and the limitations of the agent that he is using.

He should also have a clear understanding of the pathology and accompanying conditions that may aid or impede him in his case.

His pathology he presumably learns in his medical course and supplements with such experience as he has been able to gather from his opportunities.

The knowledge of his remedies, unfortunately, in the larger majority of cases he must gain from that school of experience that is inflexible in its demands and often cruel in its results.

Many remedial agents exist, from the many *new cults* with their so-called divine aid, on the one hand, down the line to the "slushy" saturation of a poor struggling system with Galenicals on the other, and when a correct diagnosis is made who can truly say which is the correct one to employ?

Altruism certainly demands the concession to every practitioner the use

of such remedies as meet his own approval provided that they can be safely and intelligently administered by him.

The scope of this article admits of discussion of one modality only, and that the electric current as a means of alleviating the many conditions that we are called upon to treat, and the writer wishes only to express such views, gathered from experience, and much collateral reading of the old masters, as will possibly serve as an excuse for his constantly increasing admiration for this safe, sane, and very efficient method of aiding suffering humanity. The method will not perform miracles, and will not cure all cases; but, everything considered, it will succeed in producing satisfactory results in a larger per cent of cases, provided it is used with discretion and a knowledge of its peculiarities that is always essential, than any other one method of treatment, and it has the additional advantage of being quick, often instantaneous in action, and that too without any danger to the patient.

In the use of this agent, that we may have a clear understanding of the underlying principles always governing this, as all other forces of nature, let us first assume that there are truly only two phases of diseased conditions, which, for the sake of being properly understood, we will call *Positive*, or *Hypersthenic*, and *Negative*, or *Anesthenic*.

Under the *Positive* we include all such as are attended with inflammation, congestion, soreness, acute pain, bruises, fevers, sprains, extraneous growths, expanded muscles, and swellings of all kinds.

Under the *Negative* are included paralysis, local or general debility, contracted muscles, nervous prostration, cold extremities, torpid liver, and inaction in any part of the system, atrophy, or tendency to decomposition, local or general.

Now corresponding to the above classification of diseases, we have the *Positive* and *Negative* poles in our various forms of electric apparatus.

We have discovered that, wherever we place the positive electrode, or pole, it decreases the electrical action in the part; and wherever we apply the negative electrode, it increases the electrical action; and that just halfway between the electrodes the current is neutral, whilst at the two extremes we have the greatest positive and negative action; or, in other words, one half the distance is positive, the other negative. Hence by understanding how to direct the current we can increase or diminish the electrical action in any part at pleasure; and, as all diseases exist by virtue of an unbalanced condition in our system, by restoring an equilibrium we lessen, remove, or cure the disease.

We have discovered, also, that the positive current (in the tissue) is alkaline and hot, while the negative, under the same conditions, is acid and cold; that, where the positive applied current enters, it produces a cooling effect which corresponds to the acid condition, while the negative produces warmth, or an alkaline condition.

As all substances can be classified under one or the other of these heads, we see the philosophy of applying the electrical element, both for the restoration of the lost equilibrium, and also for the production of those chemical changes necessary to return the different parts and organs to their normal or healthy conditions.

Again we have discovered that the course of the current is *always* from the positive to the negative; hence we say the negative *attracts* the positive; and that the negative *aggregates*, or gathers, while the positive *segregates*, or diffuses. Therefore, if we desire to reduce glandular or other enlargements we apply the positive electrode to the part. It is evident from what has been said that where we apply the positive electrode the current *goes in*, and where we apply the negative the current *comes out*: hence we say all positive currents are *inward* and all negative currents are *outward*. Assuming that the *nervous fluid* is a modified form of the *electric*, which undergoes in the brain and great nerve centers that change which best fits it to become the agent of the mind, we see how it really forms the connecting link between that something which we call soul and all its organs and functions of life; how it becomes the life force of the animal economy, and hence must permeate every part of the organism.

It has for its highway and fountain the brain, spinal cord, and three-fold system of conductors, viz. the nerves of sensation and nerves of voluntary and involuntary motion.

This vital or life fluid is subject to the laws of electrical polarity, both in its general circulation and in every organ of the body. When in health the positive and negative poles balance each other; but any agency that changes this relation may become the cause of disease; causing that to be abnormally positive which should be negative, and that which should be positive to be abnormally negative.

Now in the correct procedure we restore this abnormal polarization by properly applying the poles indicated, as explained above, thus relieving or curing the disease.

In order to have our currents produce the desired effect the circuit must be perfect; hence the two poles must inclose the body, or the part of it to be treated, between them, which then acts as a conductor and makes the circuit complete.

Three things are absolutely necessary in the successful treatment of disease by this as in all other methods, viz. a correct diagnosis, a thorough and scientific knowledge and application of the agent employed, and correct habits on the part of the patient. After making our diagnosis, we must in treating our patient pay especial regard to polarity.

As was before stated, when the two electrodes are in contact with the body, one half the distance is positive, the other half negative, and the center may be said to be neutral.

In treating inflammatory or positive conditions we must bring *all these* parts under the influence of the positive current; for, if we do not, we shall fail in changing the polarity and curing the disease. In treating all inflamed or painful conditions it favors the operation to run the current *with* the nervous ramifications, because its effect is more soothing. Even in treating such cases through and through it is well to keep the negative a little way *below* the positive.

In treating subacute affections we must act according to the necessities of the case; but as a general rule it is best to subdue the pain and irritation, first, by treating with the positive over the painful part, although in some chronic cases it may, strictly speaking, be a negative disease.

As all negative diseases require increased action, the parts affected must be brought under the influence of the negative end of the current; and in many cases of wasting or atrophy and paralysis we often allow the current to run against the nervous ramifications, as it is more warming and tonic in its effect.

But in this case we must be governed by the class of nerves which are paralyzed. If it is the nerve of sensation we must run the current from the spine to the extremities; but if the nerves of voluntary motion, we must run the current from the extremities to the spine, bearing in mind that the current always runs *from* the positive to the negative, and takes the most direct course and the best conductors.

The dry skin is a bad conductor: hence we moisten it with our moist sponge electrodes, water being a better conductor. Fresh water is not so good a conductor as salt water: hence the fluids of the body that are impregnated with salt are good conductors, and an electrode moistened with salt water is far more effectual as a conductor than one moistened with plain water.

Thus far methods only, with their explanatory reasons for use, have been discussed.

No attempt has been made to explain the important part that electric currents play in our general metabolism, and just why it may be the indicated agent in all cases of disturbed functional activity. No single article could do justice to the subject. It is of such an amplitude that one would need more latitude than could be allowed in an ordinary single publication to properly interpret the message that nature sends to us through the aching nerves of this human microcosm, telling in no unmistakable terms that there is a lack of equilibrium somewhere in its many ramifications which yields more readily to electric influence than many other less available remedies.



# DEPARTMENT OF DIETETICS

## MARASMUS.\*

BY J. A. DENKINGER, M.D., BOSTON, MASS.

**SYNONYMS:** Athrepsia, Infantile Atrophy, Simple Wasting.

Simply defined, marasmus is a disease of nutrition, whose essential feature is wasting. As Rotch puts it: "It is a condition in which extreme atrophy of all the soft tissues takes place without demonstrable disease of any of the organs." No sharp line can be drawn between marasmus and simple malnutrition. (Kerley describes malnutrition as the first stage of marasmus.)

Despite the numerous hypotheses advanced by American and European authorities, "there is as yet no convincing evidence of constant gross or histologic changes in the intestines or liver in marasmus" (Wentworth), and the true pathology of marasmus may be said to be still unknown.

On one point, however, all authorities agree, viz., that the disease is always associated with grave impairment of the digestive function, and especially with defective intestinal assimilation.

The disease is most frequent during the first six or eight months, less frequent from the eighth to the twelfth month, and comparatively rare from the twelfth to the eighteenth month. It is much more common in the city than in the country, and is particularly frequent in dispensary practice and in institutions. It is rare amongst breast-fed infants. According to Holt, the disease is very frequent amongst premature children and the illegitimate offspring of girls of sixteen or eighteen, indicating that the disease is associated with more or less constitutional weakness or low vitality.

It is more than probable that a number of factors are concerned in the etiology of this disease, but *improper food* is undoubtedly the most frequent cause of it. By "improper food" is meant that the infant does not obtain the quality and quantity of nutriment required for its own peculiar needs. In the language of Rotch, "The disease is extremely rare in infants who are fed from the very beginning on a proper modification of milk, adapted to the infant's nutritive development."

If we inquire into the feeding history of artificially fed marantic infants, it is comparatively rare to find cases where the food supply has been *insufficient*. Overfeeding seems to be the rule rather than the exception. The food is frequently excessive in quantity and too rich in quality, but more

\*Reprint from National Eclectic Association Transactions, 1907.

often the infant is overfed with milk poor in quality and unsuited to its individual powers of digestion.

Besides constitutional defects and "food causes," the disease is favored by bad air and other unhygienic surroundings and long-continued disturbances of digestion.

As to the symptoms of marasmus, it may be said that the appetite of marantic infants is generally good, often enormous; and only in the most severe cases, poor.

The stools are frequently normal in appearance, but are very large in proportion to food taken. Close examination of stools also shows much undigested food. (The infant eats much, but absorbs very little.) The odor of the stool is often peculiarly offensive and putrid. Vomiting is by no means common. The most constant symptom is a steady loss in weight, a rapid disappearance of adipose tissue and atrophy of muscle, resulting in a most striking physiognomy. The infant seems to be reduced to skin and bone, and has the appearance of a little old man or living skeleton. The skin, having lost its tone, is "all wrinkles" and hangs in folds. The face is thin and pinched, pale or of a leaden hue, and has a peculiar "old" look, and bears a striking resemblance to a monkey or fetus, the cheekbones are prominent, cheeks and temples hollow, chin pointed, giving the mouth the appearance of great size, the fontanelles are sunken, the eyes are deep-lying and have the appearance of great size. The expression is either dull or vacant, or tired and anxious. The tongue is coated and dry, the extremities are cold, often cyanotic, the hands are more like "bird's claws." The abdomen is either very flat from atrophy of the intestinal and mesenteric tissues or else prominent from distension with gas.

The temperature is usually subnormal, the pulse rapid but feeble, the breathing shallow. Bedsores over the sacrum, occiput, and heels are quite common, also redness and excoriation of the buttocks, especially when the stools are very acid. Some marantic infants cry a great deal, but more frequently they are quiet and listless; they sleep much with but little change of position, and only fret and whine when disturbed.

The prognosis is generally bad. The chances of recovery at the age of eight months or one year are much better than at four months, as the former ages are evidence of pretty strong vitality. The prognosis is, of course, much worse in cases of long duration. In institutions the disease is almost invariably fatal.

As to treatment, this seems to be one of the diseases where drug treatment is practically useless, and proper food and feeding and favorable hygienic surroundings — everything. All authorities are in agreement that the food-remedy par excellence is breast milk. The results of breast-feeding on marantic infants have, in the main, been so very favorable, that it should be tried without delay whenever practical, and artificial feeding

should only be resorted to when a wet nurse is unobtainable or impractical or has proven a failure. Along with breast milk, the marantic infant should live in the open as much as possible where it can secure plenty of fresh air and sunlight.

As to artificial feeding. First — Quantity of food.

The quantity of food should be governed by the powers of the intestinal absorbents of the sick infant and not by the seeming demands of the baby's appetite. The baby's weight, rather than its age, should be our guide in the quantity of food given, and only so much food should be given as seems to be properly taken care of by its weakened digestive and absorbent system.

Our aim should be to insure complete assimilation of what is given before increasing the quantity of food.

Second — Quality of food.

All authorities agree, and all metabolism observations show, that atrophic infants assimilate fats very badly. Sugar, on the other hand, is absorbed readily and in rather large amounts.

Milkcasein is poorly absorbed in marasmus, but if proteids are administered in soluble form, as in whey or the soluble albumenoids of cereals, fairly high proteid (1-1.50 per cent, or even more) may be given.

This would point to a food mixture containing a comparatively large percentage of sugar, a fair amount of soluble albumenoids and very little fat.

Rotch begins with a mixture containing

Fat as low as .50 per cent.

Sugar, 6. per cent.

Proteids, 1. per cent.

As the infant increases in weight he increases the fat percentage, but for a number of weeks not above one to two per cent.

Keller, to whom we owe much of our present knowledge of marasmus, also advocates a food-mixture, which, in addition to being distinctly alkaline in reaction, is low in fat and proteid, but relatively high in sugar, preferably maltose. His reasons for preferring maltose to other sugars are as follows: Maltose is superior to other sugars to increase body weight, in other words, is more assimilable; he also found that maltose produced less gastro-intestinal disturbance than other sugars. Heubner, too, found that maltose is better utilized by the organism of the sick infant than lactose and other sugars. The assimilation limit is also higher for maltose than other sugars.

Koplik highly endorses the Keller method of feeding "malt-soups," or dextrinized gruels, in cases of marasmus. To quote Koplik: "It is one of the most useful methods of feeding marantic infants, and one in which in a great number of cases of atrophy has given me brilliant results. I have used this method of feeding in cases in which all other known methods have failed. These children had been fed on modified milk prescribed in a most careful manner by men who may be considered skillful in its administration."

The chief objection to the homemade malt-soups of Keller, as well as the dextrinized gruels made familiar to us by Chapin, is that they require great care and much time for their proper preparation. I have never been able to see wherein they possess the slightest advantage over the plain malted or Liebig foods, of which Horlick's Food is a good example.

By varying the proportion of the malted food and milk and water, any practically desirable mixture can be obtained and the food adapted to the digestive capacity and nutritive requirements of the individual infant.

Equally efficacious in the feeding of marantic infants is malted milk (Horlick's). This preparation requires the addition of water only and assures us a good quality of milk. This food has given me most gratifying results. I begin with a heaping teaspoonful of malted milk, dissolved in three ounces of water, increasing the amount of malted milk very gradually.

Buttermilk has also a well-deserved reputation in the feeding of marantic infants, and is well worthy of trial, but care should be taken to secure a clean and fresh supply.

Ass' milk, being low in fat and containing proteids in very digestible form, has also proven most useful in the treatment of marasmus, but the difficulty of obtaining it makes its employment rather impractical.

Freshly expressed beef juice has also given good results and may be given in alternation with the other food mixtures. Orange juice too has been used with benefit.

Water should be given freely, but in small amounts. Great care should be taken to keep the infant, especially the extremities, warm, by wrapping it in wool or flannel. It is also well to rub the infant with olive oil. Daily massage and alcohol rubs are highly recommended by Tuttle.

To remove bacterial poisons and toxins the digestive tract should be cleaned out by means of calomel or castor oil or enemas of salt and water.

It should be remembered, however, that barring the necessary therapeutic measures requiring manipulation, the infant should be disturbed as little as possible.

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The wealth of a man is the number of things which he loves and blesses, which he is loved and blessed by.— *Thomas Carlyle.*

Cast forth thy act, thy word, into the everlasting, ever-working universe; it is a seed-grain that cannot die.— *Thomas Carlyle.*

## DIETETIC TREATMENT OF SCARLET FEVER.\*

VOMITING is the rule at the outset of the malady, but is rarely troublesome afterward. During the few days of fever, cold drinks — water, acid drinks, seltzer, etc. — should be given freely. The food must be liquid.

Milk is the best. It can be varied by gruels, oranges, stewed or baked apples, and stewed prunes. But while the fever ranges high it is best to use only milk or gruels. These ought to be given every hour, in doses of from three to five ounces. When the throat is intensely sore, swallowing may become so distressing as to cause children to refuse food. Then rectal alimentations must be resorted to. Care should especially be taken that enough fluid is administered by rectum or hypodermically to maintain good elimination by the kidneys. Ice cream can often be swallowed with comfort when fluids give pain.

Such a diet should be prescribed as will avert nephritis. The latter occurs more frequently in scarlet fever than any other eruptive disease. It usually shows itself in the second or third week of the malady.

Since nephritis appears almost as often after mild scarlatina as after severe cases, great care in regard to diet must be taken in all cases during the first three weeks of the illness.

Milk is the best food during the time. Koumyss, Matzoon, and gruels may be employed for variety if a strict milk diet cannot be maintained. When convalescence is established, there may be added to milk diet oatmeal, soft boiled rice, puddings of cornstarch, farina, and sago, with cream, milk toast, baked potatoes, stale bread with butter or fruit jellies, baked apples, stewed apples, stewed prunes, and oranges. After the third week, fish, such as creamed codfish, oysters, oyster or clam broth, squabs and breasts of chickens, and later the red meats, may successively be tried. A greater variety of simply cooked vegetables may also be used. Adults may have tea, coffee, and cocoa.

During the first days of convalescence, care must be taken that too much food and food of too varied a character be not taken. Children become extremely hungry, but their desire for quantity and variety cannot safely be satisfied.

When, in spite of such care, inflammation of the kidneys develops, the regimen must be that of nephritis rather than that of scarlet fever.

\*N. S. Davis, "*Dietotherapy, Food in Health and Disease.*" Blakiston, Philadelphia.

# EDITORIALS

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PITTS EDWIN HOWES, M.D., *EDITOR.*

JOHN MARSHALL FRENCH, M.D., *ASSOCIATE EDITOR.*

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### THE COMMON COLD — ITS PREVENTION.

POSSIBLY there is no one thing that is responsible for so much mischief to the human economy as the condition denominated a "common cold." It is of the most frequent occurrence and with it also comes the equally familiar expression, "I am sure I do not know how I got it."

Each year this condition forces itself more prominently upon our attention, and many physicians do little or nothing for its relief until a more serious departure from health, as a result of this non-interference, is brought to their attention.

There is one cause that has never received the amount of care from the medical fraternity which its bearing upon our topic demands; that is the quality and quantity of clothing which is worn next to the skin. Regulate this properly and a very large majority of your "colds" will become matters of ancient history.

As soon as the cold season approaches a very large percentage of our population will don their heavy woolen underwear, as a protection from the "colds" which are their usual companions during the winter months. This

is one of the very worst things they could do, for there is no material used for clothing which will hold so much moisture as woolen and takes so long to dry thoroughly.

Passing our time, as most of us do, in over-heated houses, offices, or work shops the slightest exertion will call out a perspiration over the surface of our bodies which is rapidly absorbed by the loose, spongy fibers of the woolen garment. This gives us a more or less damp surface next to the body; consequently in going outdoors and entering a much colder temperature we are in the most favorable position to have a chill communicated by the wet cloth with which the body is wrapped.

Any person stopping to consider this statement must see its force and truthfulness. After granting this, the next question presents itself. What shall I wear to protect me from the cold and yet rid myself of this unnecessary means of contracting the disagreeable colds?

Before answering this question let us consider what are the prime essentials necessary for the clothing which should be worn next to the skin. In determining this we must not lose sight of the fact that the skin must have an opportunity to free itself of the impurities which are constantly oozing from the pores and rendered more profuse by the exertion which produces any great degree of perspiration. Not only this, but the garment must be so constructed that this poisonous secretion should have an opportunity of passing through it and so be gotten away from the body and a chance of being reabsorbed be prevented.

From these statements we see that it is essential that the body clothing should be made from a material that will permit of the easy transudation of the exhalations from the body and also that will quickly resume its natural dryness when moistened by these exhalations in their passage.

There are four classes of materials which may be used in the construction of our undergarments which are worn next to the skin. They are wool, silk, cotton, and linen. Of these four the linen will dry most quickly, but the ordinary linen fiber is tough and tightly woven, so it will not allow the moisture to pass off as rapidly as might be desirable.

The desire of producing a fabric that would combine all of the good qualities and eliminate those which were deleterious was the object of a series of investigations by Dr. Deimel, of California, a number of years ago. As a result of his efforts, a material known as Deimel's Linen-Mesh was woven, out of which undergarments have been made that will combine the necessary qualifications of hygienic underwear.

To those who are skeptical concerning these statements I would advise that they exchange their woolen underwear for linen and watch the results concerning their susceptibility to contracting colds.

Wear the same underwear the year round and vary the outside clothing and your tendency to catching colds will be reduced to the minimum.

## OUR COLLECTIVE INVESTIGATION REPORTS.

WE have undertaken to study with the help of our readers, and to report through the JOURNAL the results of our combined study, some of the less known drugs which we believe are of sufficient value to repay the effort made. We are asking the help of our readers, not as a mere formality, but because we cannot do the work without your help. In fact, if the result is to be a success, you must do the larger part of the work. If you will send in your reports, we will compare and collate them, and between us we may hope to get some results of value to the profession at large.

(1) Most of all, we want reports of your own personal experience with the drugs considered, either in the line of physiological experimentation or clinical observation. If not previously published, so much the better, but we want them anyway.

(2) We also want the results of any studies you may have made of the writings of others, which we have not embodied in our preliminary report. If you have access to works we have not, give us the benefit of them, and always give your authority.

(3) In addition to the general action of the drug, we want to know the thing that each drug will do better than it will do anything else, and better than anything else will do that thing. In short, we want *the best uses of each drug*.

(4) Report your failures as well as your successes. If a drug has notably failed to do the things it was advertised to do, then show it up as a failure, at least as far as you are concerned. Next to finding out what a drug is good for, is finding out what it is not good for. If any of these is being exploited in current medical literature as being beneficial in conditions for which it is actually of no value, then it will be a distinct benefit to the profession if we can expose its pretensions, and show it up as a fraud. Remember, *we have no drugs to sell*.

(5) We shall also be glad to have you ask questions concerning the drugs to be considered. Not, indeed, that we expect to be able to answer them, but we may hope to find some one else who will. "In a multitude of counsellors there is safety." So let us all lend a hand.

J. M. F.

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Let not future things disturb thee, for thou wilt come to them, if it shall be necessary, having with thee the same reason which thou now usest for present things.—*Marcus Aurelius Antoninus*.



## BOOK REVIEWS.

ALL books reviewed in this department will be sent postpaid upon the receipt of the quoted price. Send money order or bank check, making payable to Pitts Edwin Howes, treasurer.

*The Treatment of Disease*, a Manual of Practical Medicine, by REYNOLD WEBB WILCOX, M.A., M.D., LL.D., Professor at the New York Post Graduate Medical School and Hospital; Consulting Physician to the Nassau Hospital; Visiting Physician to St. Mark's Hospital; Fellow of the American Academy of Medicine, Member of the American Therapeutic Society, and of the American Medical Association; Permanent Member of the Medical Society of the State of New York; Honorary Member of the Connecticut State Medical Society; Vice-Chairman of the Revision Committee of the United States Pharmacopœia, etc. Second Edition, revised. Octavo, 932 pp., cloth, \$6 net. P. Blakiston's Son & Co., Philadelphia.

The author of this book is to be commended for the thoroughness with which he has described the various classes of disease; their etiology, pathology, symptomatology, and diagnostic points are all well given and with much precision. It is to be regretted that he has not been equally as clear and comprehensive in the department of treatment. Here his teachings take on too much of generalities to be of great service to the younger practitioners of medicine. There is too much left for them to find out without any definite guideposts to mark the way.

*What Shall We Eat?* The food question from the standpoint of health, strength, and economy. Containing numerous tables, showing the constituent elements of over three hundred food products and their relations, cost, and nutritious values, time of digestion, etc., indicating best foods for all classes and conditions. By ALFRED ANDREWS. Second edition, revised, 125 pp., cloth, 75 cents; leatherette, 50 cents, postpaid. The Health Culture Co., New York City.

Although this little manual was written for the laity, yet there are many things contained within its covers which will prove of use to the practising physician; the quotations from the larger and more pretentious works on dietetics are all good and to the point.

*Materia Medica and Clinical Therapeutics*, by F. J. PETERSEN, M.D. 12mo, 400 pp., cloth, \$3 net. Published by the Author, Lompoc, Calif.

To the close student of medical therapy this book will prove of much value, especially along the line of the vegetable remedies; the primary and secondary action of the different drugs are both considered and the various indications for them are very clearly pointed out.

The author is to be commended for the research of which this work is the outcome.

*Therapeutics of Vibration*, the healing of the sick. An exact science. By WILLIAM LAWRENCE WOODRUFF, M.D., Member of the American Institute of Homeopathy, the California Homeopathic Medical Society, the South California Homeopathic Medical Society, Los Angeles County Homeopathic Society, South California Academy of Sciences; Author of *Climatography of the Salt River Valley Region of Arizona*. 16mo, 144 pp., cloth, \$1.50 net. J. F. Elwell Publishing Company, Los Angeles, Cal.

Every physician who is at all interested in the subject of vibration should procure this book and read it very carefully. Every page is pregnant with thought, and the reader cannot help considering the views advanced. Those chapters which attempt to show, and with much reasonableness, that the action of drugs on the human economy are also based on vibratory motion are of special interest to those who are working for the advancement of drug therapy.

*An Aid to Materia Medica*, by ROBERT H. M. DAWBARN, M.D., Professor of Surgery and of Surgical Anatomy, New York Polyclinic Medical School; Professor of Surgery, Fordham Medical College, New York; Visiting Surgeon to the City Hospital, New York. Fourth edition, revised and enlarged, by EDEN V. DELPHEY, M.D., 16mo, 338 pp., cloth, \$1.75 net. The Macmillan Company, 66 Fifth Avenue, New York City.

This work is based on the latest revision of the Pharmacopœia and contains much information that will be of value to those who wish to post themselves in the rudiments of this part of medicine. An alphabetical index of the unofficial remedies in use by the medical profession adds considerably to its usefulness as a book of reference.

*A Text Book of Alkaloidal Practice*, by W. F. WAUGH, M.D., and W. C. ABBOTT, M.D. 8vo, 822 pp., cloth, \$5. Published by the Clinic Publishing Co., Chicago.

This is the long-promised work of the alkaloidal leaders, Doctors Waugh and Abbott. Though based to some slight extent upon Dr. Waugh's previous work, *The Treatment of the Sick*, it is builded new from the foundation. In the sections devoted to treatment — and these are the most important part of the book — the authors have depended mainly on their own experience and that of the great body of physicians using the active principles in their practice, as presented in the pages of the Alkaloidal Clinic and its successor, the American Journal of Clinical Medicine. The changes which they advocate consist largely in the substitution of the active principles for the cruder vegetable preparations, whereby they claim to obtain more positive results. The work is one of great value, and every user of the active principles will desire to have it at hand for daily use.

J. M. F.

# Journal of Therapeutics and Dietetics

Vol. II.

JUNE, 1908.

No. 9.

## SOME REMEDIES FOR ABDOMINAL PAIN.

*Sp. Med. Dioscorea Vil.:* Where there is colicky pains in the bowels accompanied with pain on pressure; pains which are aggravated by walking and relieved by supporting the abdomen and keeping quiet; *Dose:* Add 10-20 gts. to four ounces of water and give one teaspoonful from every fifteen minutes to every hour.

*Sp. Med. Nux Vomica:* Use this drug when you meet paroxysmal pain which is continually pointing toward the umbilicus; the face is sallow and the tongue is pallid. *Dose:* Add 5-10 gts. to four ounces of water, and give in teaspoonful doses from every ten minutes to every hour according to the severity of the pain.

*Chloroform:* This is a grand remedy when you meet continuous pain which is due to flatulence. *Dose:* Add 10-20 gts. to two ounces of warm water and give in teaspoonful doses every fifteen minutes. If there is any nausea in connection with the pain add 5 gts. of *Sp. Med. Lobelia* to your chloroform mixture and give in the same sized dose.

*Podophyllin, 2x:* Full tongue with pasty secretion that is of a yellowish white color. The abdomen is full and has the appearance of being swollen. The veins are also full and there is the general symptoms of biliousness. *Dose:* Add 1 drachm of the 2x. to four ounces of water and give in teaspoonful doses every two or three hours.

*Sp. Med. Colocynth:* This drug is extremely useful when the pain is of a sharp, cutting character and much gas is passed at stool. The dose *must be small.* 1 or 2 gts. to four ounces of water and give in teaspoonful doses from every fifteen minutes to every hour.

*Magnesia Phos. 3x.:* This patient will complain of pains which are sharp and of a spasmodic character. They come quickly, with little intermission, and are relieved by hot applications. *Dose:* Add two grains to tablespoonful of hot water and repeat every fifteen to thirty minutes until relieved.

*Sp. Med. Chionanthus:* The special indication for this drug is pain in the epigastrium and right hypogastrium: there is severe pain over the region of the liver which simulates colic. There is also considerable yellow tint to the skin and also of the urine. *Dose:* 20-40 gts. in four ounces of water, given in teaspoonful doses every thirty minutes to two hours.

# DEPARTMENT OF THERAPEUTICS

## DRUG STUDIES.

### THE RELATION OF CONIUM AND HYDRASTIS TO THE MAMMARY GLAND.

BY HERBERT T. WEBSTER, M.D., OAKLAND, CAL.

KNOWLEDGE of the specific action of conium upon the mammary gland considerably more than antedates the earliest history of Eclectic medicine. Hahnemann, in 1818, published an account of the therapeutics of this drug, including, among other reputed properties, its action on the breasts. Even then, however, this was not a new idea; Dioscorides was aware of it in his time, and employed poultices of the fresh plant to prevent undue development of the breasts in young girls, and Pliny and Avicenna recommended poultices of conium and corn-plaster for the removal of mammary tumors.

Dunham, in his work on Therapeutics, is emphatic concerning the prompt action of this drug in the cure of non-malignant tumors of the mammary gland, asserting that he has numerous times removed such growths from the breasts by its internal or specific use; and his testimony is supported by that of many other physicians of his school.

But our own school offers some testimony on the subject, though older authorities are silent. Ellingwood's *Materia Medica and Therapeutics* mentions the application of this agent to diseases of the breast, as does also the last edition of the *American Dispensatory*. *Dynamical Therapeutics* will be found to contain reference to the subject, though the author was not as well confirmed in the value of the remedy from personal experience at the writing as at the present time. Even that staid representative of conservative therapeutics, the *National Dispensatory*, recognizes the specific affinity of the agent in this direction.

Perhaps one of the most practical uses made of it is its application to painful fullness of the mammary glands about the menstrual period, a complication to which quite a number of females are subject, and one so unpleasant sometimes as to demand effort for its amelioration or relief. Few agents apply so well to this condition as conium.

Though hydrastis is an old eclectic remedy, we are compelled to admit that knowledge of its action on the mammary gland came to us second

hand. It has long been employed in certain quarters as a remedy in mammary cancer, at least since 1863, and has some cures to its credit, though there is much doubt about its power in actual cancer. Possibly, at a very early period of mammary cancer, before malignancy has become very much developed, we may find some remedial action in it, but we should be more satisfied with its power to remove benign mammary tumors; for these may be the forerunners of malignant disease, and prevention is "just as good" if not better than a cure.

In 1863 Doctors Marston and Maclimont reported some remarkable success with hydrastis in mammary tumor. Among the cases referred to was one which was so striking that I will quote the report, since it has an application to the subject in hand:

"Mrs. F. had suffered for six months from a swelling in her left breast, for which she sought relief. The pain, which was compared to knives being thrust into the part, had become almost unbearable, and the patient was already beginning to assume that worn appearance so characteristic of the cancerous diathesis. The tumor, which had attained a considerable size, was hard, heavy, and adherent to the skin, which was dark, mottled, and very much puckered, the nipple being also retracted. The patient was advised to come into town for the enucleation of the tumor. This, however, the circumstances prevented; and without any expectation of affording much relief a lotion of hydrastis was ordered, with internal use of the same medicine. The pain almost immediately ceased, and the tumor so speedily decreased in size that at the end of two months it had altogether disappeared, leaving but the puckered skin, which had otherwise regained its natural appearance. When we last heard of this patient she continued perfectly well. It is needful to state that her health rapidly improved during the treatment, and that her countenance regained the aspect of health."

I doubt that many cases of cancer will ever be cured with hydrastis, for the remedy has been so thoroughly tested in certain quarters that a reputation ought to be established for it now, if it is entitled to one. However, in my hands, it has entered into a combination which has proven very reliable in mammary tumors of benign type, and even in some which manifested symptoms suggesting malignancy, though it has proven curative only in the very early stage. If it possesses much virtue in mammary cancer it must be in prevention, not in cure after malignancy has become well established. I will here offer report of several cases which have been under my notice, and which have been treated with a combination of conium and hydrastis. Possibly conium alone might have accomplished as much as the combination, though I give hydrastis credit of at least improving digestion and assimilation in cases attended by cachexia.

In 1880 Mrs. G. applied to me for treatment for a growth in the left breast. The tumor was not painful nor sensitive to touch, nor was there

any marked retraction of the nipple to suggest malignant disease, but a history of cancer in the family rendered the presence of the growth very disquieting to the patient and her friends. The growth was near the size of a hen's egg, situated beneath the nipple, and considerably denser to touch than the surrounding tissues. It had been several months in developing, and the subject had gradually failed in health until she was weak, nervous, dyspeptic, and sallow. She was of lymphatic temperament, and about forty-five years of age.

In those days surgical measures were not accepted by the public as readily as at present, and no such idea as that of an operation would be listened to by either patient or her husband. The question was: Could anything be done without? I knew of the reputation of conium and hydrastis in such cases but had never tried them. I proposed that I have three months to try, and having been granted that request, prescribed specific conium two drams and specific hydrastis two drams, to eight ounces of vehicle, consisting of water with enough alcohol to preserve. Of this the dose prescribed was a teaspoonful four times daily, — before meals and at bedtime.

On this treatment the general health improved the first month, though no noticeable change had taken place in the mammary growth. At the second month it was found, however, to have lessened considerably in size, and by the end of the fourth month it had disappeared. The general health of the patient was now good, and I learned, from her own lips, ten years later, that she had remained free from any symptoms of disease of the breast and had enjoyed average health in the interval.

In 1890 Mrs. W., more than eighty years of age, applied to me for relief of pain in the right breast. It was lancinating, and so severe as to prevent sleep at night. The patient informed me that her breast was shrunk and hardened. An examination revealed retraction of the nipple, fixedness of the mammary gland to the wall of the thorax, and general hardening of the breast. It was a typical case of scirrus breast, and I could offer no hope of permanent relief to the son of the patient, who had brought his mother to me and who desired to know the worst. However, I undertook to ameliorate the intense pain, that rest at night might be enjoyed, and prescribed half an ounce each of specific conium and specific hydrastis in a pint of vehicle, to be taken in teaspoonful doses four times daily. In a fortnight the pain was much relieved, but not entirely gone. Echinacea had then but recently come upon the stage as a remedy for cancer pain, and I decided to add it to the treatment. Half an ounce of echinacea was therefore added to a pint of vehicle and alternated with the combination of hydrastis and conium, a teaspoonful four times daily. The pain almost immediately ceased, and the patient afterward, so long as she continued the remedy, enjoyed good sleep at night, a good appetite and perfect diges-

tion. The malignant growth progressed slowly, but the patient lived more than four years afterward, finally dying from arterial hemorrhage from a small ulcer that had opened at the side of the retracted nipple. Several times she became disgusted with the idea of continually taking medicine and stopped it, but was compelled, on account of the severe pain, which invariably returned in a few days, to continue treatment.

In 1892 Mrs. F. applied to me for examination of a hardened lump in the left breast, which had appeared a few months before. She was about the menopause, and her mother had died with cancer of the breast about this age; consequently, though her general health was good, she was anxious to have something done about the abnormal growth. The tumor was about the size of a walnut, located near the nipple. It had been noticed about a year before, and had been slowly increasing in size. The patient's health was fairly good, except that much mental depression was present as a result of the threatening morbid growth. The tumor was neither painful nor sensitive to pressure. Conium and hydrastis dispelled the growth in less than four months, and five years later I learned that no further symptoms of mammary hardening had been noticed.

In 1900 Mrs. S., an old patron, called upon me for treatment for tumor of the breast. A hardened lump had recently developed in the right breast, which manifested some symptoms of malignancy. The patient's complexion, which was naturally clear and rosy, had become sallow, and her countenance had assumed a haggard, worn expression, and she complained of debility and loss of spirits. The tumor was not much larger than a walnut, and was located under the nipple, or slightly at one side, but it appeared to be adherent to the skin, which was somewhat puckered at that point, and there was tendency to retraction of the nipple. I regarded this case with considerable apprehension, though no pain attended. The prescription of conium and hydrastis already described was ordered for this case, and persevered in for more than four months. Finally, all traces of the morbid growth had disappeared, and the patient was restored to her former condition of good health and clear complexion.

These are by no means all the cases in which I have given the remedies named a trial, but not all have persevered in treatment until results could be positively stated. In these piping times, with all kinds of doctors and all kinds of beliefs, chronic cases drift about like straws before the wind, in many instances, and not every one ever has a fair trial at any hand. I believe, however, that in these two remedies we have nearly a specific in new growths of the breast of benign nature, especially if they appear at the menopause. Which one deserves the most credit it is difficult to decide, from my experience, though if I were to depend upon a single one of them I certainly should choose conium. However, hydrastis adds considerable to the quality of the prescription, in its ability to promote digestion and as-

similation, and restore general health. I believe the selective action of conium to be the active element in the removal of the local lesion.

As no local application was made in any of the successful cases I have reported, there can be no doubt as to the specific action of the internal agents. If the medicine did not cure, what did?

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## A STUDY OF THE TWELVE TISSUE REMEDIES.

BY JOHN WILLIAM FYFE, M.D., SAUGATUCK, CONN.

### NO. IV.—FERRUM PHOSPHORICUM — PHOSPHATE OF IRON.

THE phosphate of iron constitutes a medicament which should not be neglected by eclectic physicians, for its therapeutic field embraces many wrongs of life which are almost daily presented for consideration. The fact that it is one of the drugs known as the "twelve tissue remedies," and that it is extensively employed by homeopathic practitioners seems to cause many good Eclectics to overlook its great usefulness. This neglect of a good remedy is decidedly wrong, for Eclecticism is boundless in principles, and its adherents should, therefore, investigate everything likely to prove beneficial to the sick.

Ferrum phosphoricum is successfully employed in all abnormal states, depending on a relaxed condition of muscular tissue, and also in wrongs of the blood.

In all ailments in which congestion constitutes a prominent characteristic the influence of the third trituration of this preparation of iron is unmistakably corrective, and in the first stage of all forms of inflammation its action is always in a positively curative direction. In all diseases presenting a muco-purulent discharge, with a tendency to hemorrhage, it exerts a restraining influence, and in all forms of hemorrhage caused by a relaxed or weakened condition of the blood vessels ferrum phos. is one of our most reliable remedial agents. In the diarrhea of children whose faces appear pinched, when the skin is hot and there is great thirst, this medicament will render excellent service. It is especially valuable in the treatment of children who, in addition to debility and failing appetite, manifest a tendency to become dull and listless, and at the same time are constantly losing weight and strength. In such cases it exerts an influence which makes for increase in strength and better bodily development. In many inflammations, and some of the eruptive fevers, especially in young and sensitive children, its action seems to stand midway between aconite and veratrum. My invariable guide to the use of these three remedies in



fevers is as follows: Small and frequent pulse, aconite; medium and frequent pulse, ferrum phosphoricum; full, bounding and frequent pulse, veratrum. This rule I find to work very satisfactorily.

In the acute febrile or initiatory stage of all inflammatory affections of the respiratory tract, including rhinitis, laryngitis, trachitis, bronchitis, pneumonia, pleurisy, and pleuro-pneumonia, small doses of ferrum phos. may be depended upon to aid much in a rational treatment. It also constitutes a valuable remedial agent in the first stage of gastric and enteric fevers, and in the inflammatory stomachache in children resulting from chill, and causing loose evacuations from the bowels, this agent often exerts the only needed corrective influence.

In articular rheumatism, especially of the shoulder, it is an effective remedy, and in pains extending to the upper part of the chest, attacking one joint after another, it has been highly recommended. It is also believed to be useful in muscular rheumatism, and in rheumatic affections of the aged, when the muscles are stiff and weakened, with a disposition to painful cramps, the phosphate of iron exerts a sustaining power which is very gratefully received by the patient, but if the cramps are severe it is well to combine it with *viburnum prunifolium*.

In all catarrhal and inflammatory fevers, and during the feverishness at the beginning of any disease, this agent is very useful. Many cases of chicken-pox, erysipelas, and erysipelatous inflammations also come within the range of its curative action. In erysipelas it is employed both internally and externally with excellent results. It promptly reduces the heat, blood accumulation, pain, and throbbing which accompany the beginning of abscesses, boils, carbuncles, and felons, and when the fauces is very red and painful, but without exudation, the exhibition of ferrum phos. will afford marked relief. It also exerts a considerable relieving power when there are noises in the ears caused by blood pressure resulting from a relaxed condition of the veins not returning the blood properly.

In incontinence of urine resulting from weakness of the sphincter or excessive secretion of urine, its action is decidedly corrective, and in irritation of the neck of the bladder it is deemed a remedy of merit. In the early stage of gonorrhoea and in orchitis ferrum phos. is employed with good results; and in epididymitis it often constitutes a useful remedial agent. When the menses are too frequent and profuse, and there is pressure in the abdomen, bearing down sensation and constant dull ovarian pains, accompanied by pain in the top of the head, this agent will exert a relieving influence. In vaginismus and vaginitis resulting from dryness and increased sensitiveness of the organ, ferrum phos. has been used with much advantage. As a preventive of fever after childbirth it is also deemed useful.

The following indications taken from Fyfe's *Materia Medica* will suggest the lines along which this drug may be profitably studied:

"Fever at the commencement of any disease, when the pulse is not full and bounding; capillary congestion with burning sensation of the skin; inflammation of the eyes with sharp pain; feeble, compressible, and quick pulse, indicating debility, especially in children; congested nasal mucous membrane, unnatural redness of mucous membranes of the mouth; inflammation of the fauces, characterized by redness and pain, without exudation; red and inflamed tonsils and swollen glands; excessive congestion of the uterus at the monthly periods; bearing down sensations with constant, dull ovarian pains; pains in the back, loins, and over the kidneys; debility of children where there are no organic lesions; convulsions with fever in teething children; febrile stage of inflammatory affections of the respiratory tract; hyperemia of the brain, producing delirium; dull, heavy pain on top of the head; first stage of cold in the head; incontinence of urine from weakness of the sphincter, especially in children; diarrhea caused by chill."

The dose of the third trituration of the phosphate of iron is five grains, but it is usually employed as follows:  $\mathcal{R}$  Ferrum phos., 3x, gr. xx to  $\mathfrak{z}$ i; water,  $\mathfrak{z}$ iv. Teaspoonful every hour.

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## THE CULTIVATION OF MEDICINAL PLANTS.

BY J. M. FRENCH, M.D., MILFORD, MASS.

FOR the country doctor who finds himself in possession of a little land and some spare time, there is a large opportunity in the raising of medicinal plants. Here is a field which is not overworked, where prices are good, and there is but little competition, as compared with that in most other lines of business. There are, it is true, a few parties who are engaged in the raising of medicinal herbs to a considerable extent, such as the Shakers of Canterbury, N. H., and Mount Lebanon, N. Y.; S. Gould and Brothers, Malden, Mass., and H. G. Hotchkiss, of Wayne County, New York, who raises the bulk of the peppermint and spearmint of the United States. But when we consider the immense and increasing demand for these things, and look at the competition existing in most lines of business, it is evident that here is an unusual opportunity.

Millions of dollars' worth of drug plants are imported into our country each year, which might just as well be raised at home in our own fields and gardens. The high prices which are paid for these imported roots and herbs should make it of interest to our farmers and gardeners as well as our botanists and scientific men, to study and investigate the conditions which are needed for their growth and proper development, with a view to engaging in this comparatively new industry in America.

It is said that belladonna and digitalis can be grown in any good garden soil. Large quantities of burdock and yellow dock roots are imported each year because no one in America will take the pains to dig and market the despised roots which are growing under their very noses. Between \$500,000 and \$1,000,000 worth of licorice is brought into this country each year, chiefly from the region about the Mediterranean Sea; and yet the licorice plant can be grown with profit in the southern parts of the United States. In our southern states, also, camphor can be grown to advantage, according to the results of experiments undertaken by the Department of Plant Industry of the United States Government. The same authorities report that the despised Jimson weed, *Datura Stramonium*, is capable of being made to yield returns equal or greater than can be obtained from wheat and other staple crops. Poke root, *Phytolacca Decandra*, is another example of a medicinal plant which can be raised with profit.

But the plant to which I desire at this time to call especial attention and the one which seems to me to offer better returns to the producer than any other with which I am personally acquainted, is *Hydrastis Canadensis*, or Golden Seal. Not many years ago this root was to be found growing wild in abundance in the forests of the middle states, Ohio, Indiana, Pennsylvania, Virginia, West Virginia, and some others. At that time its uses were limited, its users were few, and its price was low — not over twenty-five cents a pound for the dried root. But in recent years, berberine and hydrastine, the two principal alkaloids of golden seal, have come very decidedly to the front in the drug market, and are now used quite extensively by physicians of all schools. One result is that the supply of the wild-grown root is now almost entirely exhausted. Another is that the price has gone up at a rate almost without precedent, and is still climbing higher. This is shown by a review of the prices current for the last ten or fifteen years. Thus, in 1895, the highest market price of the dried root of golden seal was twenty-three cents per pound. In 1897 it had gone up to sixty-two and one half cents, and in 1899 to seventy-five cents. In 1904 the price had reached \$1.25 per pound; in 1906 it ranged from \$1.75 to \$1.85; while at the present time (April, 1908) the price list of the Eastern Drug Company lists it at \$2.40 per pound. This constant advance in price shows that its uses are increasing, while the supply is growing less; and the prospect is good for a continued advance for some years to come, or until the supply of cultivated root has become sufficient to stock the market, of which there is no immediate prospect.

These figures make interesting reading for the man who is looking for an opportunity to get good returns for work done and money invested. The opportunity is certainly here. The Department of Agriculture at Washington has undertaken to encourage the cultivation of golden seal as a paying crop, by carrying on the necessary work at its experimental

station, and furnishing the necessary information to farmers and all others interested in regard to the proper conditions, by means of bulletins issued through its regular channels. These experiments have been carried on only since 1899, and on a small scale, so that the end is not yet, but the prospect so far is certainly favorable.

My personal experience in hydrastis culture is quite limited, and I am not setting up as an expert by any means. Nevertheless I have learned some things which may be of interest to my brother physicians. Indeed I have been led to the writing of this article by the very considerable interest which was manifested in a paper which I wrote for the Medical Council last year, and which was published in the August number. From the number of letters of inquiry which this paper brought me from all parts of the country, I am led to believe that the subject is one of general interest.

I have used hydrastis in my practice for thirty years, and have found it a most valuable drug. Owing to its rapid advance in price, about two years ago I became interested to know whether it could be cultivated to advantage in New England, and determined to make some experiments for the sake of deciding it. To begin with, I wrote to Merck, Squibb, Lloyd, Merrill, and some other large users of golden seal root, to learn their views in the matter. With one exception, these were favorable. I next sent to the Department of Agriculture, Bureau of Plant Industry, for Bulletin No. 51, on Golden Seal, and also supplied myself with such other literature on the subject as I was able to obtain. Last spring I sent for one hundred plants, and set them out in my garden, shaded them according to directions, and furnished them with the proper conditions so far as I was able. In some parts of the country last year the season was so wet that there was complaint that seal root was inclined to rot; but my garden was dry, and there was no trouble on that score. Indeed, it was rather too dry if anything.

It went through the season safely, but it seemed to me that the growth was but slight. As it takes three years to bring the root to the proper degree of maturity for gathering, it is yet too early to draw any positive conclusions. But the plants not only lived through the first summer, but have gone through the first winter in safety, and are just now coming up in good shape this spring.

I will not undertake at this time to give definite directions for the cultivation of hydrastis, but if there should be evident any general interest in the matter, I shall be glad to do so at some future time, when I will also report the further progress of the plants under New England conditions.

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Whatever prohibits or prevents a man from his sacred appointment to labor while he lives on earth — that, I say, is the man's deadliest enemy.—  
*Thomas Carlyle.*

## PHYSICAL THERAPY.

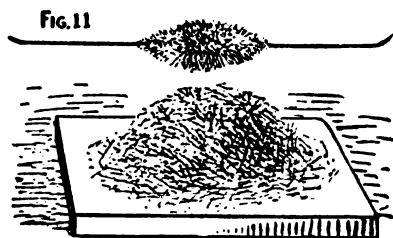
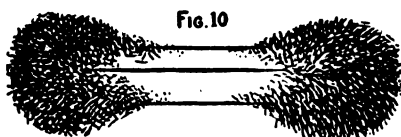
## FIRST STEPS IN MEDICAL ELECTRICITY.

## CHAPTER III.

## PHYSICS OF THE COIL CURRENT.

BY HERBERT MCINTOSH, A.M., M.D., BOSTON, MASS.

If a bar magnet is immersed in a heap of iron filings it is found that the filings adhere to the magnet in large masses at the poles.



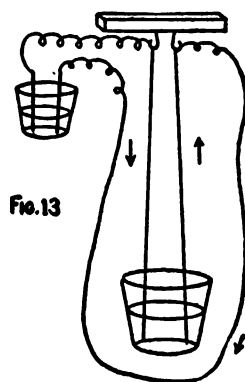
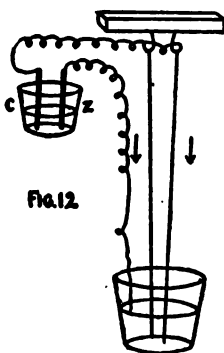
In like manner if a piece of copper wire which carries an electric current is immersed in a heap of iron filings, it is found, when the wire is raised, that the iron filings adhere to it.

If an electric current be permitted to divide and flow in the same direction through two copper wires which are parallel, it is found that they attract each other. If, however, the current flows in opposite directions they repel each other.

From these experiments we may deduce the law;

*Parallel currents in the same direction attract each other; parallel currents in opposite directions repel each other.*

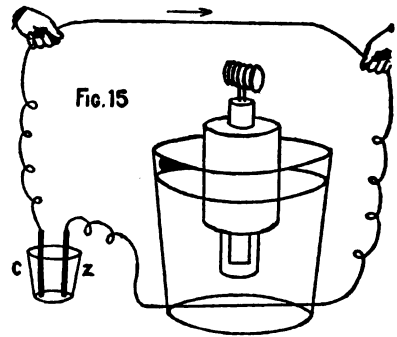
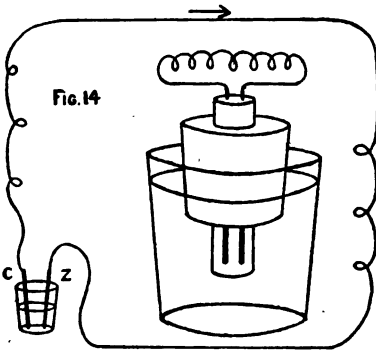
□ If a copper wire carrying an electric current be placed above and parallel to the helix (or coil of wire) of a floating battery, it will be found that the helix will instantly turn so that the currents will flow in parallel planes.



From this experiment we may deduce the law: *Angular currents tend to become parallel and flow in the same direction.*

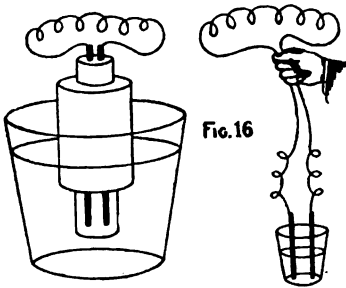
In like manner if two floating helices be placed end to end and their

respective currents allowed to flow in the same direction, it will be found that the helices attract each other. If, on the other hand, their respective



currents are allowed to flow in opposite directions, the helices will repel each other.

Enough has been shown by these simple experiments, and by those already presented, which illustrate the deflections of the magnetic needle, to prove the intimate relation existing between electricity and magnetism, and to lay a foundation for further study of this interesting subject.

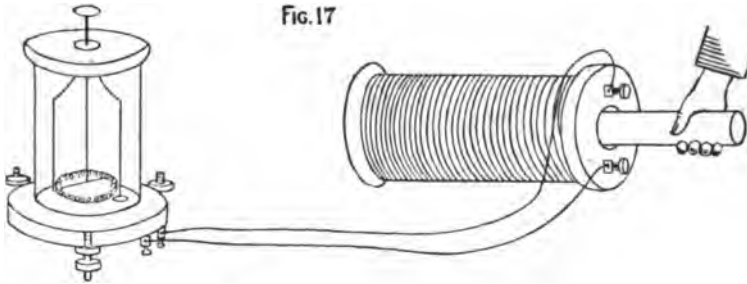


If a helix is connected with a galvanometer, and a magnetized iron bar is thrust inside, it is found that the needle of the galvanometer is immediately deflected. When the bar is removed it is found that the needle is again deflected, but in the opposite direction, and in each instance it is observed that the needle resumes its normal position when the motion of the magnet ceases. From this experiment we may infer that the electrical energy excited in the coil is at the expense of mechanical energy.

If instead of introducing a permanent magnet within the helix we introduce a bar of soft iron, and move back and forth over one extremity of the soft iron one of the poles of a permanent magnet, the needle of the galvanometer is violently agitated, turning in one direction at each approach and in the opposite direction at each departure of the magnet. If the experiment is repeated with the opposite pole, the currents, as shown by the galvanometer, are reversed.

If now instead of introducing into the helix a permanent magnet or a bar of soft iron influenced, as described above, by a permanent magnet, we introduce another helix connected with a battery, and move it back and forth, we obtain precisely the same results.

Now, it is to be observed that the current flows in the secondary coil only during the motions of the primary coil, and delicate measurements have proved that the total quantity of induced electricity depends upon the rapidity of movement, not upon the time required to make the change. Hence we derive the law: *In any induced current the E. M. F. at any instant is proportionate to the rapidity of the relative change at that instant.*

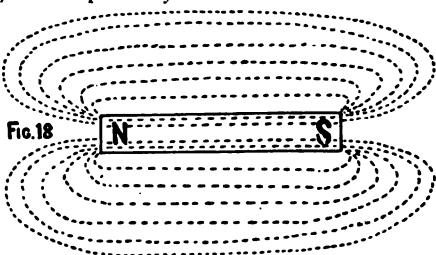


If instead of introducing and withdrawing the primary coil, we allow it to remain stationary within the secondary coil and close and open the primary circuit, we obtain exactly the same phenomena as were obtained with a permanent magnet or with a to and fro motion of the primary coil. It is in effect the same thing. We may summarize the results thus far obtained as follows: *When a current in a primary coil is made, the induced current has a direction opposite to that of the primary.*

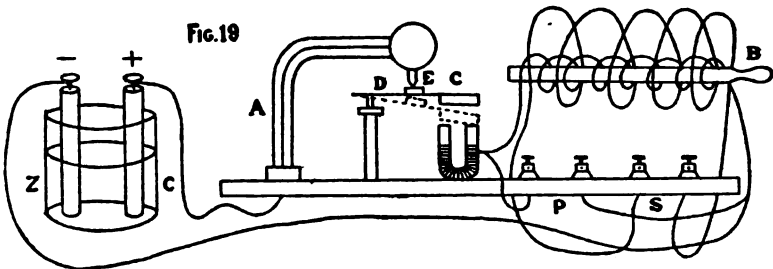
*When a current in a primary coil is broken, the induced current has the same direction as the primary.*

**EXTRA CURRENTS.** The principles above explained apply not simply to conductors which are detached from each other, but to neighboring portions of the same conductor. When, for example, a circuit is closed, the current does not immediately reach its greatest intensity, because a current opposite in intensity is at once developing in the same conductor, which tends to diminish the intensity of the inducing current. On the other hand, when the circuit is opened, the induced current being in the same direction tends to increase the intensity of the primary current.

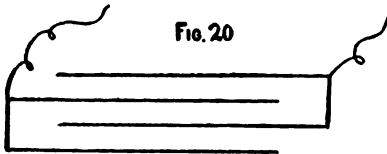
**INDUCTION COILS.** If a piece of soft iron or a bundle of soft iron wires be inserted within the primary coil, it is found that the magnetization and demagnetization of the core greatly increase the intensity of the secondary currents. The core is further utilized to make and break the current of the primary coil automatically, or a separate electromagnet is provided for this purpose, as shown in Fig. 19. When a current passes



through the primary wire A, the soft iron in the electromagnet F is magnetized. The magnetism thus excited attracts the soft iron hammer C mounted upon the spring D, thus opening the circuit. The circuit being



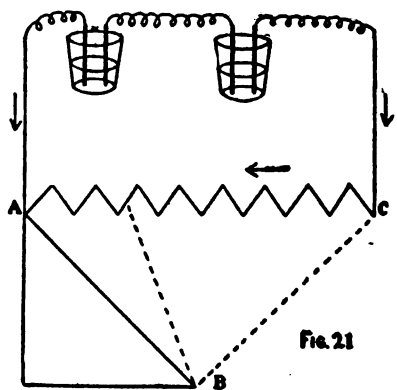
now open, the magnet loses its magnetism, the hammer returns to its former position, again closing the circuit, and thus repeating the process. Instruments constructed upon these principles are called induction coils.



**RHUMKORFF'S COIL.** If an induction coil is provided with a condenser, it is called a Rhumkorff's coil. A condenser consists of two or more layers of tin foil separated by paraffin paper. Alternate layers are connected with the positive and

the negative pole of the battery and constitute a shunt from the primary coil. The purpose of this addition is to provide an escape for the extra currents above described, which find it easier to pass into the condenser than to leap across at E (Fig. 19), vaporizing the points of contact, and thus prolonging the time occupied in breaking the circuit. Moreover, as the condenser discharges into the primary coil, and in an opposite direction to the current flowing in the coil, it seems to demagnetize the core and promotes rapidity of action in the vibrator.

We have thus far presented the essential principles underlying the action of direct and coil currents. These principles have been set forth inductively; that is to say, no principle has been announced without first presenting the facts by way of a simple experiment from which the student may himself deduce the principle underlying the facts presented. For purposes of condensation, self-explanatory terms have not been defined, but all that is essential in the physics of these currents has been presented, and the





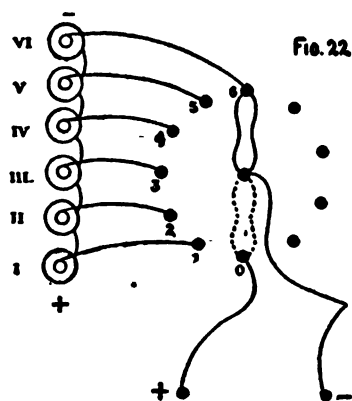
student who has acquired them has laid the foundation for an intelligent study of medical electricity.

In coils wound for medical purposes it is customary to use in the primary coil a wire having a diameter several times larger than that used in the secondary coil. Naturally, therefore, the length of wire employed in the secondary coil considerably exceeds that used in the primary. In general, it may be said that the E. M. F. of the secondary coil increases with the number of turns of the wire. This, however, is modified by the increased resistance offered by the increased length of the wire and also by the presence of induced or extra currents.

**MEASUREMENT OF COIL CURRENTS.** This is not so simple as the measurement of direct currents, yet several instruments have been invented for this purpose, notably those of DuBois Raymond, and Giltay, of Delft, Holland. An instrument called the "Faradimeter" has been designed by Dr. Sloan, of Glasgow, whose purpose is to measure the currents of medical induction coils, and another instrument has been invented by the late Lord Kelvin for a similar purpose.

**REGULATION OF COIL CURRENTS.** If a hollow cylinder of brass or copper is introduced between the primary coil and the bundle of soft iron wires constituting the core, it will be found that the E. M. F. of the current is greatly reduced. When the cylinder is gradually withdrawn, there is a corresponding increase in the strength of the currents. This is due to the fact that the cylinder cuts the lines of magnetic force of the core, and its gradual withdrawal permits them to exert their full energy. This is the method commonly employed for the regulation of currents in medical coils.

**RHEOSTAT.** If a piece of slate covered with graphite, or a coil of wire having a high resistance is interposed between a source of electrical energy and the poles, a means is obtained of regulating the quantity of current delivered to the patient. Such a device is called a rheostat. By moving the lever A B (Fig.-21) upon the surface of the graphite or coil A C, a greater or less amount of resistance is introduced into the circuit and the quantity of current delivered thus regulated.



Still another method is illustrated (in Fig. 22) where six cells joined in series are connected with six studs fitted upon a plate above the cells. When the lever is placed upon the stud marked O, it is evident that no current will flow. When it is moved to stud 1, 2, 3, 4, 5, or 6 respectively, it is clear that the number of cells will be thrown into the circuit between the binding screws which is indicated by the number of the stud upon which the lever is resting.



## CONCLUSIONS REACHED AFTER THREE YEARS' EXPERIENCE WITH THE LEUCODESCENT LIGHT, WITH A FEW CASE REPORTS.

BY WM. LAWRENCE WOODRUFF, M.D.

Author of "Therapeutics of Vibration" and "Therapeutics of  
Light Vibration."

Two years ago Mrs. A. came to me, suffering with a deep-seated pain one inch above and one half inch back of the left ear. It was one of the worst cases of pain I ever encountered. My diagnosis was commencing abscess in brain. A fifteen-minute treatment with the leucodescent light gave relief. The light was moved slowly back and forth over the side of the head at close range; that is, so close that the lamp brushed the hair. This treatment had to be repeated because of returning pain every three or four hours for the next ten days, when the pain materially subsided. A daily treatment for the next few days entirely relieved the case, with no return up to date.

One night about eleven o'clock Mrs. B. came to the office with an excruciating neuralgic pain, deep seated in the right temple. She was beside herself with the pain, but would take no medicine. I focused the leucodescent rays on the seat of the pain, which was quickly relieved, but as soon as the light was turned off the pain returned, consequently for three hours the light was steadily applied, when the relief became permanent. The next night at the same hour the pain returned, when one hour's application of the light in the same way gave permanent relief. There was no return of the pain.

Mrs. W., the same being my wife, caught cold from working among the flowers one spring day two years ago. That night she awoke me about eleven o'clock, screaming with pain in the lower limbs. On examination, found her broken out with hives, and it proved to be the worst case in my experience of twenty-five years' practice. In a few minutes she was one solid mass of blotches over the whole surface of her body, including head and face. Her suffering was the most intense I ever saw. The blotches would raise from the size of a hand to that of a dinner plate, and during the stage of swelling the pain was frightful. As fast as the light rays relieved one spot, I would have to play them on a new point of swelling. Thus for four hours I kept treating first one area and another, until I had the attack conquered. During the next day she had but little trouble, but that night about midnight they flamed up again, but not so bad. After two hours' continuous treatment entire relief was experienced, with no return of the trouble. The agony experienced during the swelling of the blotches was terrible; this the light

would relieve in two or three minutes, only to be succeeded by other fields of irritation and swelling.

Mrs. T., ulcerated cornea, three ulcers as large as pinheads; has had several previous attacks. The corneal inflammation was quickly controlled and ulcers healed in a week's time. She now swears by the leucodescent light; says it did the work for her better than any other treatment; that it controlled the pain almost as soon as applied. The light was focused on the eye with the lid closed.

Mr. A., acute rheumatism of the shoulder, suffering intensely for the last ten days. After two treatments with the leucodescent light, reports entirely cured. Treatment consisted of moving the light slowly from side to side, over surface involved.

Miss S., aged eighteen years, blonde temperament, pain in region of both ovaries, very sensitive to pressure, both ovaries considerably thickened, menses painful and scant. A daily treatment of twenty minutes for four weeks entirely cured this case and after two years there has been no return. The treatment consisted of focusing the light rays on each ovary for five minutes, the lamp being at a bearable distance from the patient; this followed by slowly moving the lamp from side to side for ten minutes, the lamp being at about eight inches distance from the body.

These are a few cases selected from the hundreds I have treated with the leucodescent light rays. It is only very occasionally I use the lamp alone in a given case, consequently there are but few cases that I can cite as having this treatment alone. My estimate of the leucodescent light in treating diseases can probably best be shown by using a few extracts from my book, entitled, "*Therapeutics of Light Vibration*," now in press, as follows:

"The leucodescent lamp by a scientific arrangement of hood and reflectors produces a light having somewhat less of the infra and visible red rays, consequently less radiant heat with rather more of the green and blue violet rays than has sunlight. While there is this slight difference between the leucodescent light and sunlight the difference is not sufficient to prevent the leucodescent light from being a white light. The composite keys of vibrations of these two lights are in such close proximity on the vibratory scale that they are both white. By this arrangement of hood and reflectors, considerable of the radiant heat waves is eliminated and the light is richer in the blue violet frequencies, consequently the position of its composite key of vibration is slightly above, on nature's vibratory scale, that of sunlight.

In treating diseased conditions, this is rather an advantage than a disadvantage, because a very large majority of patients treated have a too low atomic cell vibration and it is not a disadvantage to raise these vibrations slightly above normal for the time being, for they will very soon settle back to normal; then again it is more comfortable for the patient to have less of the radiant heat waves to contend with.



Remember, in studying this modality, that it has a similar composite key of vibration to sunlight, and that they occupy practically the same position on nature's vibratory scale and that they exert practically the same influence over the atomic cell vibration of the human body, and that what is said of one in a therapeutic sense applies with equal force to the other.

The leucodescent light because of the above facts can reach down to the almost quitting cell vibration of the collapsing patient, pick up his cell vibration and slowly but surely attract and draw this cell vibration up the scale towards and to its own composite key of vibration. On the other hand, it can reach up to the top of the crest of the wave to the excessive cell vibration of the patient who is so overwrought as to be on the verge of collapse; it can attract this excessive cell vibration and draw it towards and to its own composite key of vibration and ultimately restore the cell vibration of the overwrought individual to its normal position on the vibratory scale. It does this because this white light, even though it is artificially produced, contains all the light frequencies that sunlight contains, consequently it has over the human body the same sphere of action that sunlight has over vegetable life.

Remember the full sphere of action of a vibrating force is to draw cell vibration towards and to its own key of vibration. It can only attract and draw atomic cell vibration to its own composite key or position on nature's vibratory scale; it can never draw it beyond this point and fix it there.

This means that in a given case where atomic cell vibration is below the normal that this modality acts as a stimulant, excitant, and tonic, that it increases the cell vibration of the patient being treated; this is undoubtedly so. It restores to the normal and promotes perfect health. On the other hand, where the atomic cell vibration of the patient is excessive, where it has climbed up the wave towards or to its crest, this vibrating force reaches up to it, attracts the excessive cell vibration and draws it down the scale towards and to its own composite key of vibration. In this case it acts as a sedative.

The above refers particularly to the general constitutional effects of this modality in giving a general treatment over the whole body. In localized conditions the same principles apply with equal force. After nearly three years of using the leucodescent light in hundreds of cases, the following summary is the result of my experience:

In ulcerated teeth with pent-up pus it gives relief and better enables the patient to endure the necessary operation for permanent relief. A treatment or two after surgical relief has been obtained soothes, quiets, and promotes the comfort and wellbeing of the patient. In threatened abscess of the middle ear it has given prompt relief and prevents pus formation. In traumatic or inflammatory troubles of the eye it has in my hands afforded prompt relief and prevented adhesions; it should never be overlooked in these troublesome conditions, even in ulceration of the cornea it

acts promptly, relieves the pain and heals the ulcer. It promptly relieves pain in the eye from whatever cause, and if used frequently and long enough, will completely control the inflammatory condition.

In enlarged glands it promotes absorption, reducing them to their normal size. I have had excellent results in goitre, the gland gradually shrinking to normal size.

Remember in all cases where it is possible, a part of the time devoted to treatment the light should be used focused on the part being treated, if the area is sufficiently small to be covered by the focal point. In affections of the throat and larynx it is of especial value because of its easy application and ease of penetration to all parts of the throat.

This brings us to the chest. Here we have intercostal neuralgia and myalgia, which are promptly benefited by these light waves and often cured by one or two treatments. I have never yet known it to fail. Pleurisy is promptly controlled in its beginning, but preferably should be, when possible, previously treated with the incandescent light bath, this is so of acute congestion of the lungs. The incandescent light bath should first be used to draw the blood to the surface, thus relieving the internal congestion, this to be immediately followed by a treatment by the leucodescent light to contract the dilated capillaries that were congested and engorged with blood. This applies with equal force in bronchial troubles. I believe that any case of commencing acute congestion and inflammation of the pleura or lung tissue can be averted by this treatment. In inflammatory conditions of these parts this modality will hasten a cure.

In chronic affection of these parts it is equally useful. It will hasten resolution in advanced cases of pleurisy, promoting absorption of fluids; serous or purulent, in the purulent ones the pus is rendered innocuous. In bronchial troubles this modality has won its best laurels. In this class of cases it very promptly relieves cough and irritation, controls the congestion and promotes resolution.

In pulmonary tuberculosis it is of great benefit, for remember in this modality we have an abundance of the chemical light waves which are nature's bactericide. I am convinced after using it in a number of these cases that the blue light wave penetrates to all parts of the lung tissues, completely sterilizing them. The action of this modality in this class of cases is many fold; first it controls the capillary circulation, contracting the distended capillaries and restoring them to their normal size. It promotes absorption of deposits, ripens up deposits that are not capable of being absorbed, thus clearing out the air cells; it promotes healing of the ulcerated tissues, because of the above; the culture field for the bacilli is destroyed and there is no media for them to exist in, then these light frequencies penetrate into the tissues and actually destroy the bacilli. It is the best and safest germicide known; it not only does not destroy the tissue, but it leaves



it in a healthier condition than they were before it was used; it destroys the tubercular bacilli and all other germ life effectually, directly, and indirectly by removing the culture field and media.

I consider the leucodescent light one of the best agents available for the cure of this malady; it sheds more light on the subject than is otherwise obtainable and it does it most effectually.

In rheumatism and neuralgia wherever found it affords prompt relief, in bruises and sprains it promptly relieves pain and overcomes the congestion; sciatica is one of the stubborn things to cure, the leucodescent light is of great assistance in relieving the pain and controlling the disease.

Spinal irritation is one of the diseases in which I have had great success in its use. Slowly, at close range, swing the lamp from one end of the spine to the other, bring the lamp as close to the back as the patient can bear it; treat from fifteen to twenty minutes daily.

In insomnia the lamp should only be brought as close as is comfortable, then swing slowly up and down the spine for ten minutes. Used in this way when one is tired out nervously, it will soothe, quiet, and rest the patient. Lumbago usually yields to close application of the light. In abdominal affections it is invaluable, in cases of catarrhal appendicitis it usually gives prompt relief and often cures; place the light about ten or twelve inches from the abdomen, bring the focal point to bear on the seat of pain, leave it here for ten minutes, then give a ten minute general treatment over the whole abdomen by swinging the lamp from side to side as close as can be borne. The same method applies to ovaritis; by using it in this way many ovaries will be saved from the surgeon's knife.

In all congested and inflammatory conditions of the abdominal viscera it will be of great benefit and afford prompt relief, and will usually materially aid in controlling the pain and inflammation. In uterine complications it aids promptly in controlling pain and inflammation, it also causes uterine contractions, thus relieving engorgements; menstrual colic yields promptly to its influence, as does all other forms of colic; infantile colic is no exception to the rule. A general treatment over the lower part of the abdomen in uterine complications is advisable. In pruritis ani, vaginitis, or vulvitis the light applied directly to the parts affected, at close range, usually gives prompt relief. In enlarged prostate I have found it of great value, the gland promptly shrinks under its influence; apply it to the perineum at close range for fifteen minutes. In gonorrhea and orchitis apply to the parts at close range for fifteen minutes; here again it acts as a germicide without injuring the tissue, and no lurking germ can escape its rays. In bladder affections, either inflammatory, catarrhal, or purulent, it is of great value in promoting a cure; use at close range on parts, swinging slowly. In complications of the joints of whatever nature it will be found useful; apply sharply at close range.

# DEPARTMENT OF DIETETICS

## PTOMAIN POISONING.\*

BY JOHN PERRINS, M.D., BOSTON, MASS.

IN bringing before you the subject of ptomain poisoning it is not my purpose to attempt to give a very exhaustive paper on the subject, but rather to mention a few statements by other writers, and then add a few remarks relating to my own experience, with the hope of awakening a general interest in the minds of the profession and the public alike. The effort that has been made of late to prevent the adulteration of food, in the form of the pure food law, shows that the subject is already receiving attention from our officials. We should see to it that we do our part to bring to their attention everything that tends to destroy or impair the health of the people, whether it be by adulteration of food, or by any process of putrefaction or decay. Ptomain poisoning, according to Gould, in his dictionary of medicine, page 1209, is produced by any of the active inanimate septic or toxic substances resulting from processes of decomposition and disintegration of albuminous materials. As ptomains are chiefly developed during putrefaction, they have been termed putrefactive alkaloids. The name cadaveric alkaloids has also been given to them, but applies properly only to those obtained from the dead animal body. The dependence of a ptomain upon micro-organisms may be indirect and complicated by, or dependent upon, purely chemic changes. The kind of ptomain produced depends somewhat upon the stage of putrefaction, as ptomains are "transition products in the process of putrefaction." Their production is also influenced by the media in which the bacteria grow.

William Gilman Thompson, M.D., in his Text Book of Practical Medicine of 1902, page 974, makes the following statement: Ptomains are basic substances developed through decomposition of organic material brought about by bacterial action. Leucomaines are analogous substances developed under certain conditions within the living body. (This is in perfect agreement with the teaching of the late Professor John M. Scudder, Cincinnati, Ohio. As far back as 1872 and 1873 when he taught that some poisons were taken into the body, and some were generated within the body.) Ptomains may be developed by putrefactive changes in animal food, and passing from the intestine to the general circulation, give rise to characteristic symptoms which are sometimes of fatal intensity.

\* Read before The Boston District Eclectic Medical Society.



The symptoms of meat poisoning usually begin within five or six hours of the ingestion of the food, and consist of nausea, vomiting, colic, diarrhea, headache, thirst, vertigo, rigors, and great prostration. In fatal cases the symptoms resemble those of cholera, with cramps and twitching in the muscles of the legs and hands, violent serous diarrhea, cold perspiration, dilated pupils, a quick, feeble pulse, and cyanosis. Moderate fever 101-103 F. is often present.

One specific cause of ptomain poisoning to which I invite your especial attention is the condition in which poultry is sent to market after being kept in cold storage for weeks or months, with the entrails retained, and although decomposition is retarded by the cold, a sufficient amount of decomposition takes place to frequently render the flesh poisonous when used as food. We have here both sources of ptomain poisoning as mentioned by Gould. The putrefactive alkaloids, from the contents of the stomach and bowels, and the cadaveric alkaloids from the dead animal body. That the process of decomposition is retarded by the cold is granted, but that it is not entirely arrested is proven from the fact of very rapid decomposition which follows the process of thawing out the body. It is well known that fowls or other similar creatures must be cooked and eaten very soon after they are thawed out, or they cannot be eaten at all. The decomposition proves itself by the unsavory, or somewhat of a barn-yard odor. The latter is not necessary to prove the poisonous properties of meat so preserved. Have we not all known and some of us experienced the poisoning produced by eating the meat of fowls, when there was nothing in the odor or taste to indicate that that meat contained ptomain poison? I well remember one such experience after eating a meat of chicken pie. I have known of many similar cases in others. One case is reported to me by a Boston physician, who positively states that he and his family were made very ill by eating chicken and one of his children died as the result. I understand there is a law forbidding poultry to be sent to market with the entrails in them, but if there is it is not active, for it is rare that poultry is drawn before it is sent to market. The excuse given is they do not look so well. I fear there is another and more potent reason, namely, they would not weigh so much; consequently, in order to obtain the same profit, the price per pound must be higher; that might affect the sale in many instances. The surest and best way to bring about a change in so undesirable a custom is to refuse to buy poultry sent to market in that condition, then to instruct our patients, and all others that come within our influence, of the risk they run in eating chickens or other poultry so marketed. As, if there were no customers for them, the custom would soon be changed for a more cleanly and healthy arrangement.

## USES OF TEA, COFFEE, AND COCOA.\*

BY ROBERT HUTCHISON, M.D., LONDON, ENGLAND.

THE action of tea and coffee on the body depends entirely upon the tannic acid, caffeine and volatile oil which these beverages contain. The effects of the tannic acid are purely local; the caffeine and volatile oil, on the other hand, have a general pronounced physiological action, to which attention must now be directed.

Caffeine, like alcohol, is a stimulant, but, unlike that substance, it exerts its effects upon the central nervous system even more than upon the heart. Physiological experiments have shown that after the administration of caffeine the time occupied by nervous processes is shortened, and reflex excitability is increased. At the same time, it removes the sense of fatigue, and is apt to produce sleeplessness. It is interesting to note that these stimulating effects upon the brain were amongst the earliest of the physiological actions of tea and coffee to be recognized. Tradition has it that in the remote ages there was a holy Asiatic, Prince Darma, who spent his nights in meditation on the Infinite. One night his ecstasy was disturbed by sleep. On waking, he was so enraged at his weakness, that he cut off his eyelids and flung them on the ground. On visiting the spot some time later, he found that where each eyelid fell a small shrub had grown up. He infused the leaves of the shrub, and ever afterwards, by simply drinking some of the infusion, he was able to keep sleep at bay. That shrub was the tea plant!

A similar tradition as regards the stimulating effects of coffee is thus recorded by Johnson: "In antique days a poor dervish, who lived in a valley of Arabia Felix, observed a strange hilarity in his goats on their return home every evening. To find out the cause of this, he watched them during the day, and observed that they eagerly devoured the blossoms and fruit of a tree which hitherto he had disregarded. He tried the effect of this food upon himself, and was thrown into such a state of exaltation that his neighbors accused him of having drunk of the forbidden wine. But he revealed to them his discovery, and they at once agreed that Allah had sent the coffee-plant to the faithful as a substitute for the vine."

As a result of this action on the nervous system, tea and coffee are great aids to mental work, and the former, as De Quincey remarked, will always be the beverage of the intellectual. As a learned Chinaman said of it more than two thousand years ago,

"It tempers the spirits and harmonizes the mind,  
Dispels lassitude and relieves fatigue;  
Awakens thought and prevents drowsiness,  
Lightens or refreshes the body, and clears the perceptive faculties."

The vital centers share in the stimulation produced by caffeine, as well

\*Food and the Principles of Dietetics. William Wood & Company, New York.

as the brain cortex. After its administration, the respiratory movements are deeper and more frequent, and the heart beats more forcibly and rapidly. It is thus an important aid in combating impending paralysis of these centers in cases of coma. Binz, for example, found that dogs which had been rendered comatose by alcohol could be aroused after the administration of coffee. The fact that coffee is an antidote to alcohol is another justification for its use after dinner.

Caffeine, as we have seen, stimulates the heart through the cardiac center, but it probably has a direct action as well. When administered in the form of tea and coffee, its action is aided by the fact that these beverages are usually taken hot. The increased force and frequency of the heart's action induces a more profuse flow of urine, and so aids in the removal of waste products from the body. This, along with the stimulation of the nervous system and heart, makes tea and coffee of use in some low forms of fever, conditions in which their administration might with advantage be more extensively adopted.

The question has been debated whether or not caffeine lessens the waste of the body. Some, for instance, have contended that it acts as a kind of drag upon the chemical changes in the tissues, rendering them slower, and so enabling the body to get on with less food than would otherwise be necessary. For this contention, however, there is no satisfactory evidence. Indeed, all experiments go to prove the contrary, namely, that caffeine *tends to increase rather than diminish tissue waste*. It does not prolong life in starvation, although it may perhaps lessen the *feeling* of hunger. Experiments with the ergograph, too, have shown that tea and coffee are in no sense muscle foods, although they can temporarily increase muscular power by abolishing nervous fatigue, so long, at least, as the muscles are not completely exhausted.

The action of the *volatile oil* contained in tea and coffee has not been very fully investigated, and would appear to be slightly different in the case of the two beverages. It, too, appears to act as a cerebral and cardiac stimulant, and to it, perhaps, some of the unpleasant symptoms, such as headache and giddiness, which afflict those who, like tea-tasters, indulge in large quantities of these beverages are to be attributed.

These oils seem also to have an action upon the blood vessels which is different in the case of tea and coffee respectively, for the former tends rather to dilate the superficial vessels and render the skin moist, while coffee has an opposite action. It is in this way that tea is said to warm the body when cold, by making the circulation more brisk, and to cool it when heated, by increasing evaporation from the surface.

We may conclude, then, that *tea and coffee are in no sense foods*, in that they can neither build up the tissues nor provide them with potential energy, though they may perhaps act the parts of lubricants in the machinery of the

body by diminishing nervous fatigue. It is no doubt this subjective feeling which has led to the very extended use of these beverages by men in all ages and in all countries.

When we turn to the question as to what extent these beverages can be indulged in without injury to health, one finds it very difficult to give a definite reply. The part played by personal peculiarity and habit in the matter is very great. It has been pointed out, for example, that the result of drinking tea and coffee is to produce wakefulness, but yet there are persons who find their use in the evening conducive to sleep. Some people, again, can drink tea quite freely, but are made ill by coffee or *vice versa*. Facts like these must be recognized, although one is unable to explain them, and they make it impossible to lay down definite rules regarding the dietetic use of tea and coffee.

The bad effects usually attributed to an excessive indulgence in these beverages are of two kinds, affecting either the nervous system or the digestion. The increased excitability of the nervous system which they produce may lead to general nervousness (the patient starts, for instance, on the slightest sudden noise, or, as a tea-taster once put it to the writer, he becomes "jumpy"), tremulousness, palpitation, loss of sleep, giddiness, and depression. The nervous system in childhood is peculiarly susceptible to these effects.

The disturbance of digestion which tea or coffee, but especially the former, produces is partly due to a direct interference with the chemical part of the process, as already described, but in part also is brought about indirectly through the nervous system. The dyspepsia which results is of the atonic type, digestion being slow, often accompanied by flatulence and attended by a feeling of sinking or depression and disturbance of the heart's action.

Whilst one may fully admit the importance of the part played by tea and coffee in the production of such symptoms, yet the extent to which they prevail has probably been greatly overestimated. It certainly seems an exaggeration to talk, as some people do, of the existence of "tea drunkenness." All that one is entitled to infer is that these beverages should be used sparingly by nervous people and by those whose digestion tends to be feeble and slow.

In some cases of gout it is advisable to strike tea and coffee out of the diet, for caffeine is a source of uric acid in the body. Theobromine is so too, but cocoa contains so little of it that it is practically harmless.

The place of cocoa in the diet is not really very different from that of tea and coffee. An examination of the chemical composition of cocoa might lead one to suppose that it was of considerable nutritive value. But that would be a mistake. Theoretically, cocoa is a valuable food, but practically it is not, the reason being that so little of it can be taken at a time. In this

respect it is exactly comparable to many of the beef-extracts. The combination of cocoa with casein — as in *Plasmon Cocoa* — increases the nutritive value of the beverage to a certain extent.

It takes about ten grammes (one half ounce) of cocoa to make a breakfast cupful of the beverage, and assuming the average composition given already, this would yield about forty calories of energy. It would, therefore, require fully seventy-five such cupfuls to yield the total amount of potential energy demanded of the body daily — obviously an impossible quantity. Of course, if the beverage is prepared entirely with milk and plenty of sugar, it becomes an important food, but that is due to the milk and sugar, and not to the cocoa. Chocolate is of more value. Half a pint of milk and two ounces of chocolate yield together fully four hundred calories, and three and one half pints would suffice to supply all the energy and a large part of the building required in a day.

The action of cocoa on the system is very much less than that of tea or coffee, owing to the small amount of alkaloid which it contains; indeed, it may be practically ignored. The special preparation known as Vi-Cocoa, on the other hand, has an influence on the brain from the addition to it of a certain proportion of *kola*. The latter contains a considerable proportion of caffeine as well as a glucoside (*kola-red*), and it is to these ingredients that its action on the nervous system is to be attributed. *Kola* is said to possess remarkable sustaining qualities, prolonging muscular contraction and abolishing fatigue; but its action seems to be uncertain, and the addition of such a drug to a beverage intended to be used regularly is a practice which can hardly be recommended.

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We must learn to live,  
 Care-hardened at all points; not base and sensitive,  
 But plated for defence, nay, furnished for attack,  
 With spikes at the due place, that neither front nor back  
 May suffer at that squeeze with Nature we find — life.  
 Are we not here to learn the good of peace through strife,  
 Of love through hate, and reach knowledge through ignorance?  
 — Robert Browning

Dost thou not see the little plants, the little birds, the ants, the spiders, the bees working together to put in order their several parts of the universe? And art thou unwilling to do the work of a human being? — *Marcus Aurelius Antoninus*.

# EDITORIALS

## Journal of Therapeutics and Dietetics

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PITTS EDWIN HOWES, M.D., EDITOR.

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### LACTIC ACID — AN AID TO LONGEVITY

To the students of dietetics, there is something peculiarly attractive in the theories of Metchnikoff relating to the natural longevity of man, the causes which tend to lessen that longevity, and the means by which it may be restored, as set forth in his books, *The Nature of Man*, which was published some five years ago, and *The Prolongation of Life*, recently issued. Whether these theories shall prove to be true or false, the consideration of them is certain to be both interesting and profitable. As a matter of fact, Metchnikoff himself frankly admits that they are theories only, and are put forward as such, in the hope that they will prove of value in bringing out the real facts of the case, whatever they may be.

Not to undertake to present his whole argument, but to come at once to some of the most vital points, he states that there exists in the human body a number of cells known as phagocytes, whose chief function is to devour intruding microbes. But under certain circumstances these guardians of the body may turn into its deadly enemies by destroying and replacing its higher elements, the specific cells of the different tissues. The physical

mechanism of senility appears to be in a large measure the result of this process. Certain substances stimulate unduly the action of these phagocytes, and so encourage their encroachment on the higher tissues. Chief among these substances are the poisons of syphilis and some other diseases, and the products of intestinal putrefaction. Metchnikoff devotes considerable space to the discussion of the causes and prevention of intestinal putrefaction. According to his view, the inherited structure of the human large intestine and the customary diet of civilized man are the two elements which combine to favor the multiplication of a large number of microbes that cause putrefaction. He therefore believes that one of the chief drawbacks to a greater longevity in man, and one which is inherent in his constitution, is found in the unnecessary length of the large intestine. This he regards as serving no useful purpose in the present state of man, but as existing solely as a relic of the days when his simian ancestors fought and ran for their lives, and found it an absolute necessity to have a large intestine sufficiently long to serve as a reservoir for the waste matter of the system, which under these circumstances they could not stop to discharge from the system without endangering their lives from the attacks of their enemies. In the changed conditions which now confront the human animal, this reservoir is no longer needed, but on the other hand, possesses the disadvantage of harboring an immense number of harmful bacteria, which by their rapid multiplication through the processes of putrefaction, produce substances poisonous to the tissues, destroying their vitality, lessening their resistance to disease, and bringing on old age prematurely.

In considering the practical solution of this difficulty, and the means of overcoming this obstacle to longevity, Metchnikoff relates several instances of individuals in whom for some cause a considerable portion of the large intestine was removed, the patient recovering and living thereafter without suffering any serious inconvenience, and even enjoying better health than before the operation. Of one of these he says, "The case I have been describing, and which I am still keeping under observation, demonstrates once more the uselessness of the large intestine; it should convert the most sceptical critic. But it also shows that the suppression of nearly the entire large intestine for several years does not completely get ride of the intestinal flora. Even without this evidence, however, I do not suggest that removal of the large intestine can be thought of as a means to prevent the pernicious effect of the intestinal flora."

He next relates the experience of various observers with intestinal antiseptics. Of these, such antiseptics as calomel, salol, beta-naphthol and camphor, when administered in quantities compatible with health, do not disinfect the digestive tube at all. With tanocol the results were more favorable. Two persons who used from three to six grams of tanocol a day

showed a notable reduction in the intestinal flora. Thymol, in nearly similar quantities, had a marked antiseptic effect. But the general conclusion, reached after many experiments on the disinfection of the intestine, is unfavorable. None the less, our author does not regard the matter as definitely settled. His belief is that while the antiseptic treatment is available up to a certain point, in order to obtain results, such large quantities must be used that the treatment can be applied only in special cases and at long intervals.

More use can be made of simple purgatives which do not kill the microbes, but eliminate them by the normal channel. He relates the case of Mde. Robineau, who lived more than one hundred and six years, and who for more than fifty years was subject to frequent calls of nature. It was a remarkable fact, that in spite of her great age, she showed no signs of sclerosis of the arteries. As contrasting with this, he mentions the case of one of his old colleagues, to whom a natural desire to empty the bowels came but once a week. Sclerosis of the arteries appeared in so marked a form that he died of it before he had reached the age of fifty years. These facts point to a close association between sclerosis of the arteries and the functions of the digestive tube.

He now considers the advantages of eating extremely slowly, the object being to prepare the food in such a manner as to prevent intestinal putrefaction. His conclusion is, that while the habit of rapid eating favors the multiplication of microbes about the lumps of food which have been swallowed without sufficient mastication, yet on the other hand it is quite as harmful to chew the food too long, and to swallow it only after it has been kept in the mouth for a considerable time; as too complete a use of the food material causes want of tone in the intestinal wall, from which as much harm may come as from imperfect mastication.

He now introduces what may be termed his main contention, by considering the value of acids for preserving animal and vegetable food and for preventing putrefaction. Vinegar has long been used to preserve meats of all kinds, fish, and vegetables. But if the materials to be preserved are of the kind that give off acids themselves, then the addition of vinegar is unnecessary. Some animal products, such as milk, become acid spontaneously, and can so be preserved. Soured milk itself, because of the lactic acid contained in it, has the power of impeding the putrefaction of meat. In some countries meat is preserved in acid skimmed milk, with the result that putrefaction is prevented. The lactic fermentation is equally important in the food supply of cattle, being the chief agent that, in the process of preserving vegetation in silos, hinders putrefaction. A number of facts are presented showing the great importance of lactic fermentation as a means of preventing not only putrefaction but also butyric fermentation,



both of which processes occur in the human large intestine, and both of which hinder the preservation of organic substances. Many instances are given of races and individuals who make soured milk an important part of their diet and thrive thereon, which he considers an important testimonial to its usefulness.

From a consideration of these various facts he reaches the conclusion that the occurrence of putrefaction and butyric fermentation in the large intestine can be in a great measure prevented, and thereby the onset of old age be prevented, longevity increased, and comfort added to the closing years of life, by the use as a part of the regular diet, of soured or curdled milk, or in lieu of this, of the absorption of pure cultures of the Bulgarian bacillus, or lactic acid ferment.

For more than eight years he himself took, as a part of his regular diet, soured milk, at first prepared from boiled milk inoculated with a lactic leaven. Since then he has made some changes in the mode of preparation, and now uses the pure cultures of the Bulgarian bacillus. He is well pleased with the result of the practice, as are also a number of his friends, some of whom suffered from maladies of the intestines or kidneys, and who have followed his example with good results. From these practical experiments, as well as the theoretical considerations already mentioned, he is convinced that lactic bacteria, whether contained in such drinks as sour milk — to which might also be added buttermilk — or taken in the form of pure cultures, are capable of rendering a great service in the fight against intestinal putrefaction.

Whether the practice based upon the theories of Metchnikoff shall prove to be only "one more" in the long list of dietetic fads which spring up and die away, or shall be found to possess some elements of truth and helpfulness, which shall entitle it to become a part of the preventive medicine of the future, remains for the historian to record.

J. M. F.

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## BOOK REVIEWS.

*Nursing the Insane*, by CLARA BARRUS, M.D., Woman Assistant Physician in the Middletown State Homeopathic Hospital, Middletown, N. Y. 12mo, 409 pp., cloth, \$2 net. Published by the Macmillan Company, 66 Fifth Avenue, New York City.

The writer of this work makes the following statement in the preface: "This book, which started as a collection of familiar talks to nurses in charge of mental invalids, is the outgrowth of fifteen years' experience in a large

hospital for the insane. Its aim is to furnish special instruction and suggestions to students engaged in caring for the insane, to help new workers to a right beginning, and to aid the more experienced ones to greater efficiency."

These aims have been well carried out and the book must be a boon for those for whom it was written. There is much within its covers that will prove beneficial to the general practitioner.

*The Prolongation of Life.* Optimistic studies, by ELIE METCHNIKOFF, subdirector of the Pasteur Institute, Paris. English translation edited by P. Chalmers Mitchell, 1908. 343 pages, cloth, price not given. G. P. Putnam's Sons, New York and London.

This is a book to provoke thought, whether or not you agree with its conclusions. For a consideration of some of the more important points of the work, see editorial on "Lactic Acid as an aid to Longevity." From beginning to end there is not a dry page in the book, and it will well repay a careful reading.

J. M. F.

*Materia Medica and Therapeutics*, an Introduction to the Rational Treatment of Disease, by J. MITCHELL BRUCE, M.D., London. American Edition, revised, 1906. 632 pages, cloth, \$1.75. Chicago, W. T. Keener & Co.

The first part of this work is devoted to materia medica, in which the author has adopted the plan of systematically tracing the physiological actions and uses of the different drugs in their passage through the body, from their first contact with it locally until they are eliminated in the secretions. In the second part, which is devoted to general therapeutics, he discusses the actions and uses of remedies under the headings of the different physiological systems of the body, as digestion, respiration, circulation, the nervous system, etc., in such a way as to conduct the student from the facts with which he is familiar to the general principles of treatment. Under each system are considered its physiological relations, pharmacodynamics, pathological relations, natural prevention and recovery, and therapeutics.

J. M. F.

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## SOME REMEDIES FOR HEADACHES

*Ammonium Iodide.*—Where your patient complains of a dull ache attended with dizziness and trouble in controlling the voluntary muscles, two grains of this salt, in water, given every three hours will afford relief.

*Sp. Med. Belladonna.*—If the headache complained of is of a dull heavy character with drowsiness, add ten drops of the Sp. Med. Belladonna to four ounces of water and give teaspoonful doses every hour until relieved.

*Sp. Med. Bryonia.*—Headaches that are confined to the right side of the head and extend from front to back with soreness of the head and severe pain, the right cheek being flushed, call for the use of Sp. Med. Bryonia. Add five to fifteen drops to four ounces of water and give in teaspoonful doses every hour.

*Caffeine.*—Occasionally you will see a headache that evidently is being caused by cerebral hyperemia, as indicated by the flushed face. Two grains of caffeine given every two hours will soon produce a marked change.

*Sp. Med. Gelsemium.*—Frequently your patient will tell you that the pain covers the entire head, there is perceptible throbbing of the temporal arteries, with bright eyes, flushed face, and the general picture of intense nervous irritation. Add five to fifteen drops of the Sp. Med. Gelsemium to four ounces of water and give a teaspoonful every fifteen minutes to every hour according to the severity of the case.

*Sp. Med. Rhus. Tox.*—If the pain is situated in the frontal region, particularly over the left orbit, and is described as sharp in its nature, especially if there is a redness of the papillae on the tip of the tongue, small doses of this remedy will prove very effectual. Add five drops to four ounces of water and give in teaspoonful doses each hour.

*Sp. Med. Nux Vomica.*—Sick headaches, or those which are caused by any wrong of any part of the digestive apparatus, which is due to an atonic condition as indicated by pallor of the mucous membranes and a yellowish-white coating on the tongue, will be quickly removed by the use of the Sp. Med. Nux Vomica. Put five to ten drops in four ounces of water and give in teaspoonful doses every fifteen minutes to every hour. If any stimulation is needed add also two to five drops of Tinct. Capsicum, to this mixture and give in the same manner as before.

*Sp. Med. Passiflora.*—Headaches that are purely nervous in their causation are frequently relieved by the use of Sp. Med. Passiflora. This drug may be given in doses of from one to twenty drops every hour.

# DEPARTMENT OF THERAPEUTICS

## \*STRUCTURAL PLANT RELATIONSHIPS.

BY JOHN URI LLOYD, PH.D., PH. M., CINCINNATI, OHIO.

*Their Record:*— Among the earliest remedial agents, as well as the most useful remedies of the present, are plant products and plant agents. From the dawn of the study of medicine to the threshold of the nineteenth century, the most conspicuous of all remedies have been those formulated under the influence of vegetable life. The simples of the aborigines of all climes and lands, the remedies of domestic medicine, as well as those of empiricism past and present, the agents that science most values and most studies, have been and yet are plant structures. Every country of the globe contributes thereto. Every people of the earth partakes thereof. The Pharmacopeia of every country, the materia medica of all the schools in medicine past and present, give their best care to the remedial action of vegetable structures. These have ever been the established, the cherished remedies of all nations, and are no more to be displaced by artificial preparations from outside, than are vegetable foods to be replaced by synthetics evolved by the chemist.

Let us not neglect to credit the value of ignorance in life conservation. No man will deny the value of minute amounts of sodium and potassium compounds, of chlorine salts, of earths, of minerals in foods. Nor will he, if he thinks, undervalue the rational use of such in medicine, where either alone or as integral parts of plant structures, they serve well their part. But no reflecting man will presume to restrict his foods wholly to these unorganized substances, so no balanced mind, informed concerning the record of remedial agents of the past, and their qualities at present, will deny the supremacy of vegetable structures as corrective agents in the hands of men qualified to use them intelligently.

The life of man and the health of man depend on the conservation of energy held in the life forces that are locked in vegetable structures, be they called food or remedy.\*

*Empiricism in Food and Remedy Studies:*— As the natural foods of man are empirical (established by experimentation) so are the most useful plant remedies the result of empiricism. Lost in the past are the experiments that led man to know that wheat is a food, and the same is true of most fruits. The wanderings which give us our known foods and medicines are not less tortuous than the painful creeping of the human family from savagery into civilization. But they are more obscure, because in the main the

\* Reprint from *National Eclectic Medical Association Transactions*.

journey commenced before man presumed to record any data whatever. It antedated the records of lost civilizations, and came down much after the manner in which a robin teaches its young to eat a worm. Who can tell the number of lives lost in the experimentation that finally led to the separating of the poison that exists in the tapioca plant from the wholesome starch food known as tapioca? Who knows the number of deaths preliminary to man's differentiating between the poisonous and the edible fungi, which is yet a problem, for in this field deaths often occur? The story of how acrid arums came to be utilized by primitive people so as to become foods, or of the discovery of the distinction between the edible fish and flesh, and forms of flesh and fish unwholesome, is as obscure as the experiments that led to the utilization of innocuous weeds as foods. Somewhere in Nature's climes all food plants are, or once were, weeds. To find their value as nutriment demands experiment which establishes some as useful, then *they* become known as foods. So recent, comparatively, is the sad proving of the attempt to eat as a pot herb one of America's new plants, as to have fixed the term *Jamestown Weed* to the plant which the settlers of Virginia about Jamestown investigated to their sorrow and death. Man's search for food is a story still in process. There is yet a risk in some directions where persons uninformed partake of weeds that should be known as poisons. In England the "sow bread," or bryonia, claims each year its victims. The same is true of *enanthe crocata*. The wild parsnip is often eaten in America for parsnip, and death results. The terribly poisonous *amanita* is mistaken for the wholesome mushroom. Whole families sometimes perish, no antidote is known. And yet the weeds of the field, the plants of the desert, and the forest, unquestionably offer untold food opportunities to the human family. Let us not forget that the luscious apple came from a knotty, astringent wild fruit, that the mother of the potato grows yet as an insignificant wild tuber in Mexico, and that but a generation back the tomato was considered poisonous, and was cultivated merely as an ornamental plant.

Turn now to remedial plants. Who can even formulate the empirical wanderings that led to the discovery of the qualities of ipecac, nux vomica, opium, jalap, podophyllum, that are possessed of energies that if illogically used make them poisons, or if discreetly employed, yield kindly remedial agents. Who can trace the more difficult study that led to the discovery of the insidious, valuable qualities of less harsh agents, such as baptisia, alettris, hydrastis, collinsonia, macrotys, and that last valuable discovery of the past decade, echinacea, which but a few years ago was known only as a worthless Western weed? Who will next serve humanity in this field, or who can predict the name of the plant next to unfold its qualities? All that have been introduced are as yet empirical gifts to man in the sense that all these natural corrective agents have been established experimentally. The good of those yet to come

must as surely be the result of empiricism. All that nourishes and conserves life, all that upbuilds structures and modifies the life current or prevents the abnormal destruction of tissue, reasoning from analogy and from rational thought, has been the result of empirical gifts to mankind. The evolution was based on *experimentation* which leads to faith in that which has been evolved in the past mazes of a struggle for existence wherein as a rule no book record is preserved. The data of it all is lost.

*The Natural Structure of Foods and Alternatives:*— Among primitive lessons in food study is that of selection and differentiation between *parts* of natural bodies, be they vegetable or animal. Men do not eat the thorn of the cactus or the root of the mandrake, but the fruit or juice of the one and the fruit of the other. They do not eat the husk of corn or the shell of the almond, but their kernels. This is a familiar fact, seemingly self-evident, but some time in the past it too had to be learned by experiment. The tuber of the potato is food, not the top. Phytolacca sprouts are excellent greens, but the root is an acrid irritant. The flesh of the fruit that encloses the deadly nux vomica seeds, much as the orange seed is imbedded in its pulp, is eaten freely. All this experience taught, and were it not for the personal instruction each man gets from those already informed, would in each case have to be learned anew.

Empiricism teaches that the bark of the cinchona, the inspissated juice of the poppy capsule, the root of ipecac, the fruit of calabar, the dried juice of the catechu are remedial alteratives. They produce changes in organs or in structures by their influence on nerve current or on vitalized matter. They are natural plant structures, which experience has taught, as a crude whole, can influence or conserve life structures.

*Empiricism Extended in the Direction of Medicine:*— Let us pass the evolution which in foods is giving us new forms and combinations of old food stuffs to serve the palate and the eye, and turn our attention to therapy. Basing his reasoning on observed facts, the thoughtful modern physician, aided by the pharmacist, draws yet finer lines. With his foot on the pedestal empiricism has reared in the use of plants as a whole, he adds thereto another mite. He differentiates between the giving of certain remedial structures for disease names and the giving of them for disease expressions which accompany abnormal conditions that have given rise to such disease names. He learns that even though a fever may be always reduced by aconite, as established by more superficial observation, it is not best to give aconite in all expressions accompanied by fever. He learns that while cinchona is useful in "intermittents" it must be given only in certain stages of the affection. He learns that opium may be a friend or an enemy, dependent on symptoms, idiosyncrasies, and complications; that ipecac has two qualities, and when used in minute doses is useful in a direction that is the very antithesis of emesis, its first field. Such as this he learns by experimentation

and observation, and such truths as this can be learned only by observation based on experimentation. He also discovers that given a proven symptomatic condition, unless there be some exceptional counteracting influence, a known remedy will produce specific effects. The method by which all this is determined is empirical; the ultimate, when established, is considered a phase of scientific art.

*The Demand of Science:*— But the fact soon becomes apparent that medication for well-known and well-established symptoms is hazardous if one depends on Nature's varying vegetable crudities. As the husk and the shell of plants vary their proportions to other parts of the plant, under the influence of seasons, sunshine, and showers, likewise do the proportions and relationships of the inter-cellular structures of certain parts of the plants used in medicine vary. The farmer knows that one season a field of grain may consist of much straw and little oats, while the next year the grain may be heavy and the stalk light. Nor are all plants in a crop uniform. The tree that bears the heaviest load of foliage may be barren of fruit. The most stately cinchona tree may be covered with worthless bark. A small chestnut tree loaded with fruit may be overshadowed by a mighty chestnut bearing foliage only. This empiricism teaches. And so empiricism or observation led to the first attempt to make more uniform preparations from the crude parts used in medicine. Came then the crude extracts, both fluid and solid, the infusions and decoctions.

Finally, only one hundred years ago, morphine was discovered. Quick followed quinine, and then other bodies of a similar nature. Now entered a new thought. These energetic, chemically constructed ultimates seemed to indicate that behind every natural remedy lay a definite something that could replace in therapy the parent structure. This one-sided conception held the thought an experiment of many talented men for a hundred years, it locks many to-day in its tenacious embrace and which has been carried by some to irrational extremes. That it was a natural line for enthusiasm to take is apparently supported by the aggressive energies of a few educts and products, such as the cathartic resins of jalap and podophyllum (which are themselves complex structures) the energetic alkaloids, and a few other products which possess in themselves qualities to remind one of the parent structures. Thus it is that the conspicuous example, quinine and morphine nearly one hundred years ago, led to blanket theories (resinoids and alkaloids which well-nigh wrecked the Eclectic school half a century later, and which now distract and pervert thought in the regular school, until we observe that medical nihilism, too often the result of such medication, is fostered by continued disappointment in directions when *structures*, not *fragments*, dominate a drug.

The great mass of organic remedial agents has no one dominating definite structure capable of either isolation or of yielding, by chemical

destruction, definite ultimates. In them the natural structures, without formula or equation, stand supreme in the face of the aggressive chemist, and both his constructive and destructive art. In the materia medica of intercellular structures, no one chemically made fragment that can be broken out parallels the drug as a whole, if one knows the whole drug. Indeed, with the vast majority of valuable vegetable remedies, chemistry is inadequate to even *help* identify a drug through the reactions of any known quality possessed by either its chemically made or chemically isolated fragments. Scores of plant preparations that for half a century have been valued as remedies may be mixed; and no chemist in the world can, by his art, identify any one drug of the mixture, or by means of a formula or equation or reaction, point to any therapeutical constituent present in the mixture. Interstructural compounds exist, by their well-known qualities are they established in pharmacy and therapy, but a blank are they to the chemist's art.

The time of thousands of workers has been spent during the past century in the hope that a single thing picked out of a mighty whole can parallel the original structure. A worthy ambition is this, but one that led to the greatest disappointment this writer ever experienced in a loved scientific theory, which thirty years ago held his enthusiastic care, and thirty years ago was sadly relinquished. Unquestionable evidence taught that *fragments* created out of drugs by chemistry do not parallel the natural intermolecular structure that establish drugs as remedies.

Much of the present discouragement of regular physicians is surely due to the use of fragments only. Unwisely they have ignored the claims of plant structures which in themselves are valuable in medicine, but are neglected and discarded because the test tube and reagent of the chemist cannot create from them bodies like unto the poisonous alkaloids, atropine, strychnine, morphine. These men seek the hurricane; the still small voice has no part in such medication.

Eclectic thought comprehended the situation in the latter part of the last century, and through clinical experimentation came into possession of a great, rich field which the regular physician had unwittingly relinquished. It turned toward the evolution of a standard form of clean remedies, as nearly devoid of common plant dirt as possible, which should parallel the natural drugs, as a whole, not a fragment only. The demands of exact Eclectic medication, in which small doses of natural, preserved, soluble drug structures were to be used to meet definite symptoms, made necessary the greatest possible exactness and the kindest manipulation looking to the perfection of these preparations. The fathers foresaw wisely that on this materia medica the life of Eclecticism depended. By the use of this materia medica came their opportunity to do well their work.

*The Evolution of Structural Remedies:*—The one school in American medicine that has given its thought, its culture, its aim in the treatment of



disease by structural vegetable remedies is acknowledged to be the Eclectic school. Whilst free to use all remedial agents, be they animal, vegetable, or mineral, its great field has been the development of our native American drugs. It has taken freely from the discoveries of the regular and the homeopathic schools, crediting them therefor; it has no less<sup>1</sup> freely given to them. The ambition of the Eclectic has been to investigate, to discover, to demonstrate. With this worthy object, as the various American drugs were investigated, the therapeutical value of these drugs were given to the world. They were placed before the profession under the true names of the plants yielding them. Text-books, materia medicas, works on practice, descriptive both of the drugs and their action in disease, were written. Thus, the facts evolved were ever at the command of men of other schools, whose investigating care was chiefly given in other directions and whose study was chiefly directed towards other fields. The evolution of these Eclectic remedies has been clinical, experimental in human disease expressions (not on animals in health) by a rule which necessitated a long and circum-spect study of each remedy. It is a clinical furthering of the empiricism of the past in which as a rule the natural energetic structure of a drug dissolved in an appropriate preservative menstruum, separated from inert matters as much as possible, is viewed as a whole, and then used as a whole. Due credit is given isolated substances in their useful places. Indeed, the credit of discovering those most valued in American plant life is to be credited to Eclecticism. But we value above all the interstructural effect that comes from lifebound structures endowed with their full vital qualities, preserved in assimilable form. This vegetable Eclectic Materia Medica has been evolved by seventy-five years' study of organized plant structures. To attempt to parallel these remedies by crudities we have left behind generations ago, or by fragments broken out of them, is as illogical as to attempt to use the decomposition products of albumen as a whole. On the use of these valuable structures has the therapy of our school been established, both as to its indications and dosage. It is a therapy and a materia medica that now is increasingly sought, and is greatly needed by the physicians of other schools, whose eyes I believe are at last longingly directed toward the fruit borne by the tree of Eclecticism, in this its last quarter of nearly a century of patient life.

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Everything exists for some end,—a horse, a vine. Why dost thou wonder? For what purpose, then, art thou? To enjoy pleasure? See if commonsense allows this.—*Marcus Aurelius Antoninus.*

A man lives by believing something, not by debating and arguing about many things.—*Thomas Carlyle.*

## INTESTINAL AUTOINTOXICATION.\*

BY CHARLES A. PRATT, M.D., CHATHAM, MASS.

PUTREFACTIVE processes in the intestinal canal, and the development of physiological and pathological alkaloids, play an important part in diseased processes. Chemical investigation has shown how many diseased conditions depend upon the products of putrefaction, rather than the direct action of microbes. Long after the microbes have been destroyed, the ferments which they formed continue to act. It is thus that cold meat, though eaten with impunity when hot on the previous day, becomes a source of danger. Infectious agents have not been destroyed by the gastric juice in the stomach; they have only been neutralized, or passed into a state of latent vitality. The action of organized ferments recommences when the foods have passed through the pylorus; the acid of the gastric juice finds itself at this moment neutralized by the alkalies of the intestines. We can understand, therefore, how, if the quantity of poison increases in the intestines, an intoxication becomes possible by reabsorption of substances contained in the digestive canal, without the presence of other pathological states. Putrefactions which develop in the alimentary residues engender poison, and fecal matter is toxic on account of the union of organic principles, forming alkaloidal substances. Under normal conditions the contents of the intestines may become more toxic, and with the kidneys functionally free, if the production of toxic material is accidentally more abundant, it may accumulate in the blood in a proportion capable of causing symptoms of intoxication to arise. When fermentation has become active in the whole length of the digestive tube, we see produced a succession of phenomena truly characteristic. The usual development of gas determines abdominal tympanites, which may be from the stomach or intestines. The contents of the intestines which have become abnormally acid may not only provoke diarrhoea by irritating the mucous membrane, but irritate also the skin outside the rectum, as witness the erythema of the buttocks in the acid dyspepsia of infants. An acid reaction is substituted for the normal of the intestinal contents. We notice change in the color of the stools, bile is expelled with a green color; certain substances, administered with the view of arresting the diarrhoea, such as bismuth, give no longer a black color to the stools. These signs indicate even to the naked eye the production of acid fermentation in the digestive canal. When fermentation of a putrid character predominates, there is produced an excessive disengagement of sulphurated hydrogen, ammonia, and sulphate of ammonia, which reveal themselves to our senses by the odor of gas expelled. Parallel to these objective phenomena there exists those of a subjective character; amongst which the most ordinary are fatigue,

\* Read at Mass. Eclectic Medical Society Meeting, June, 1908.

depression, headache, buzzing in the ears, and deafness, disturbances of sight and vertigo.

With the kidneys acting well things may go no farther, but if the renal emunction is insufficient we may see developed a fraction of uremic intoxication through simple exaggeration of intestinal fermentation. If, for example, abundant vomiting has caused diminished urinary secretion we may have coldness established, paralysis of the vessels of the skin, cramps, convulsions, coma, paralysis, death even, while the kidney itself may not be diseased. It will be sufficient for the development of such accidents that the quantity of toxic material introduced into the blood should exceed the activity of the kidneys charged with the function of eliminating it. The products of intestinal putrefaction, if formed in excess, may result in an autointoxication even without the kidneys being diseased, nevertheless, the liver may give some protection, and there may be made to intervene as an auxiliary agent of protection, rapidity of intestinal expulsion by the stools.

In certain individuals habitually the subjects of diarrhoea, who have during each day only one liquid and fetid stool, we observe nearly always vertigo and some shivering. They, in general, experience bitterness in the mouth, and their breath and skin have a disagreeable odor; but all these inconveniences may disappear for a time by evacuating the contents of the large intestine. We may see more severe symptoms yield after simple evacuation of the contents of the digestive canal. And when the stomach contains substances toxic, which happens, for example, in intestinal obstruction, washing out has utility observable. Fecal vomiting bears witness to the accumulation of toxic material in the stomach, and would explain the general symptoms which accompany intestinal obstruction. The small pulse, coldness owing to paralysis of the cutaneous vessels, etc. Accoucheurs know quite well how certain febrile incidents which supervene in the course of parturition disappear after alvine evacuation either spontaneous or induced by light purgatives.

These, then, are clinical facts which agree with theory. The therapeutic treatment is affected to a certain extent by nature. We should not neglect in autointoxication to keep up the strength of the patient, so he may have time to eliminate the poison. What he requires is active force, thus we are led to administer, not tonics, but stimulants, which may awaken some force remaining latent. The substances which are generated in the intestines by putrefaction, and which are neither precipitated nor eliminated, pass on into the blood, though the liver partly prevents them from entering the general circulation; but still the true protecting agent is the kidney. We should therefore by stimulating the renal discharge hasten the elimination of this excess of the poison that has been sent into the circulation.

I am inclined to think that the result of perspiration is not beneficial,

since perspiration lessens the urine, which carries out of the system so many toxic products. It is true that perspiration may help to eliminate certain toxic substances, but the true depuration of the system is accomplished chiefly through the kidneys.

It is the kidneys that enables the body to be thoroughly cleansed, and this is effected by increasing the renal secretions by cold drinks and cold bathing.

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## A STUDY OF THE TWELVE TISSUE REMEDIES.

BY JOHN WILLIAM FYFE, M.D., SAUGATUCK, CONN.

NO. V. KALI MURIATICUM — CHLORIDE OF POTASSIUM.

WITH the possible exception of ferrum phosphoricum, kali muriaticum is the most useful, as well as the most frequently indicated tissue salt. It is an especially valuable remedial agent in the treatment of the second stage of inflammations of serous membranes.

In nasal catarrh, which is characterized by a discharge of white, thick phlegm, it has been employed with great advantage, and in stuffy colds in the head, as well as in dry corzya, it acts promptly in a curative direction.

In speaking of the great usefulness of the chloride of potassium in catarrhal conditions, Dr. Ivins says:

"I use kali muriaticum often with profit in the purulent stage of nasal catarrh. It has proved to me the most satisfactory remedy in acute inflammation of the naso-pharynx in which there is a decided burning dryness. The appearance is that of redness with marked thickening, almost as though the mucous membranes were solidly infiltrated."

To the foregoing may well be added the experience of Dr. Houghton, who says:

"This is one of the most effective remedies I have ever used for chronic catarrhal inflammations of the middle ear, especially the form designated 'proliferous.' In chronic suppuration it reduces proliferation and hastens repair."

In aphtha, thrush, white ulcers in the mouths of little children or nursing mothers, as well as in canker, excoriations, and rawness of the mouth, this trituration of the chloride of potassium constitutes a superior medicament, and in swollen glands about the jaws and neck it seldom fails to give speedy relief. The swelling in inflammation of the tongue also yields to its curative influence.

Dr. Kinnett in referring to the power possessed by kali muriaticum over the various forms of edema, in part says:

"I have used kali muriate in edema of the cellular tissues and have reduced the swelling in many cases where other well-known remedies for this condition had failed. In one very severe case of edema, accompanied with heart disease, where usually apocynum is prescribed and was prescribed and did no good so far as we could determine, I prescribed kali muriate, and the edema was all gone in a few days. The indications are just as clear for the administration of this drug as for *any other specific medicine* we possess, and can be relied upon with as much certainty. I have prescribed this remedy ranging from the crude drug in solution, to the same amount of the third decimal trituration, and can say that I am as well pleased with the trituration as with the crude drug, and am surprised often to see what small amount of the drug will accomplish the work. By all means do not neglect this remedy to prevent plastic exudates, for it only needs a fair trial to convince the observer that it will do all that has been claimed for it."

In sick headache, when the tongue is covered with a white coating, and there is vomiting of a white phlegm, this drug is employed with marked benefit.

Kali muriaticum is very extensively employed in the treatment of diphtheria by homeopathic practitioners, and many eclectic physicians have also found it effective in this disease. Dr. W. E. Kinnett, a very careful observer of the therapeutic action of drugs, in speaking of his experience with this potassium preparation, says:

"I would not attempt to treat a case of pneumonia, diphtheria, croup, or in fact any other inflammation, whether idiopathic or traumatic, in any part of the body without this remedy from first to last as the main remedy. In hepatitis, cellulitis, and in cases of that fashionable disease, appendicitis, or any other, it is this drug which, if administered early, will avert suppuration. I have treated many cases of pneumonia, both in children and in adults, with this drug and ferrum phos., no other drugs being used from beginning to end, and can say the same in many cases of diphtheria. There is no trouble to get children to take this medicine, and besides it is very effective. I have used no other remedy for croup for years except these two drugs, and in this disease I usually put a teaspoonful of each of the 3x trituration into a glass half full of water, and administer a teaspoonful every ten minutes until relieved, and then every hour till well. It acts promptly and effectually."

Some eclectic writers who have also had large experience in the use of the chloride of potassium in the treatment of diphtheria apparently are not as confident of its effectiveness in all cases of this disease as Dr. Kinnett seems to be, as will be seen by an abstract from a letter written to the author of this article by Dr. F. H. Williams, who is also a very thorough investigator of drug action. Dr. Williams says:

"I have tried kali mur. faithfully, in the third trituration, and I am convinced that it will not cure bad cases of diphtheria. We should endeavor to separate the diagnostic points in relation to their symptoms. I have seen diphtheritic cases that spot the tonsils, and possibly the sides of the pharynx. with a white multiple membrane — *always white and moist* — that kali mur, 3x will cure. But my experience shows that the drug is useless in the gray membranes that start from one nidus and largely involve the uvula."

In tonsilitis kali mur. is a very efficient remedial agent. It should be administered as soon as the swelling appears. It is also a remedy of merit in other inflammatory wrongs of the tonsils and throat, especially when grayish patches, spots, or deposits are prominent features of the case. In scarlet fever it is often a much needed medicament, and it is said to possess a power of preventing this disease which is fully equal to that possessed by belladonna. In speaking of this property of the drug, Dr. Holbrook says:

"I have recently treated a case of scarlatina with kali mur. alone, it making a good recovery. I gave the remedy to the rest of the children in the family, with the result that none of them were attacked by the disease, though they were almost constantly with the sick child."

Kali muriaticum is a remedy of marked curative power in many gastric wrongs, especially when there is constipation, with vomiting of thick, white phlegm, and a bitter taste in the mouth. In jaundice, characterized by the foregoing symptoms, its influence is promptly curative. It is also an excellent remedy in jaundice caused by catarrh of the duodenum, especially when the stools are very light in color. In all liver affections in which there is sluggish action of the organ, accompanied by pain in the right side, pale yellow evacuations, constipation, and coated tongue, this remedy will speedily give corrective results.

In acute inflammation of the bladder, especially when there is swelling and a discharge of thick, white mucous, the chloride of potassium constitutes a most useful remedial agent, and in chronic cystitis it exerts an action which is curative in its direction. Kali muriate is an efficient remedy in gonorrhoea, and it is regarded by some physicians as essential to a good treatment. It is especially indicated in cases in which swellings exist, whether resulting from subcutaneous or interstitial exudation. In suppressed, tardy or too early menstruation, especially when the discharge is excessive, dark, clotted, or tough, or tarlike in appearance, this drug exerts an influence which makes for normal activity, and in leucorrhoea, when the discharge consists of milky-white, thick and non-irritating mucus, it constitutes an efficient remedial agent. In mastitis it exerts a restraining influence over the swelling, which is often much needed.

In loss of voice or hoarseness its action is much like that of collinsonia, and often serves an excellent purpose. In the second stage of bronchitis, when thick, white phlegm of a fibrinous character forms, the chloride of

potassium constitutes a remedy of corrective power. In croup it exerts a marked influence over the membranous exudation, and in false croup it is often the only needed medicament. It is especially indicated in the second stage of pneumonia, when the expectoration is viscid and there is fibrinous exudation into the lung substance. As a remedy in the second stage of pleurisy, when there are plastic exudations and adhesions, this remedial agent has been highly recommended as a means of completing the cure. When there are wheezing or rattling sounds of air passing through thick, tenacious mucus in the bronchi, and which is raised with great difficulty, kali muriate affords much relief.

In rheumatic fever, with exudation and swelling around the joints, this drug has been employed with satisfactory results. Its influence in such cases is said to be due to its power of restoring the non-functional cells of the excretory and absorbing structures to normal activity.

Kali muriate has been employed in the treatment of typhoid fever, and has given very satisfactory results, especially when there was great looseness of the bowels, the stools being light yellow or flocculent. It also exerts a relieving influence in abdominal tenderness and swelling.

In the second stage of abscesses, boils, carbuncles, eczema, pimples, erysipelas, and many other similar conditions, when interstitial exudation has taken place, it is said that the chloride of potassium will cause the swelling to disappear before the formation of pus. It is also a useful remedy in glandular swellings and follicular infiltrations. In ulceration of the os and cervix uteri, characterized by a thick, white secretion, this remedial agent has been employed with results which were unmistakably curative.

The chloride of potassium should be more fully investigated by eclectic physicians, and the following indications, taken from Fyfe's *Materia Medica*, suggest the lines along which the study is most likely to prove advantageous:

"White or gray coating at the base of the tongue; white or gray exudations; glandular swellings; discharges or expectorations of a white thick, fibrinous slime from any mucous surface; grayish patches or spots in throat or on the tonsils; jaundice, especially when there is pain in the stomach or intestines; pale yellow evacuations, and yellow urine, with abdominal tenderness and swelling; diarrhoea, when the stools are pale yellow or clay colored; inflammation of the bladder, when there is a discharge of thick white mucus; rheumatic fever, with exudation and swelling around the joints; abscesses, boils, and carbuncles; plastic exudations and adhesions; hard, harsh, and hacking cough; short and spasmodic cough; wheezing rales, or rattling sounds in the air passages, caused by thick, tenacious mucus in the bronchi."

The dose of the third trituration of the chloride (*not* chlorate) of potassium is from five to fifteen grains, but the best results are obtained from its use by prescribing it as follows:  $\mathcal{R}$  Kali mur. 3x, gr. xx to  $\mathfrak{Z}$ i; water,  $\mathfrak{Z}$ iv. Teaspoonful every half hour to every two hours.

## ARBUTIN:

## ITS BOTANICAL SOURCES, ASSOCIATED PRINCIPLES, AND MEDICINAL PROPERTIES.

BY J. M. FRENCH, M.D., MILFORD, MASS.

## THE ARBUTIN-BEARING PLANTS.

(1) *Arctosaphylos Uva Ursi*; natural order Ericaceae; common names bearberry, upland cranberry; constituents, tannic and gallic acids, arbutin, ericolin, urson, resin, and a volatile oil; medical properties, astringent, tonic, diuretic; uses, chiefly in diseases of the genito-urinary organs, as cystitis, gravel, gleet, gonorrhoea, leucorrhoea, pyelitis, etc.

(2) *Arcotostaphylos Glauca*; natural order Ericaceae; common name, manzanita; principal constituents, tannic acid, arbutin; medical properties and uses, similar to those of uva ursi.

(3) *Gaultheria Procumbens*; natural order Ericaceae; common name, deerberry, teaberry, checkerberry, boxberry, wintergreen; constituents, tannic acid, ericolin, urson, resin, and a volatile oil, containing methyl salicylate; medical properties, antiseptic, stimulant, antirheumatic, slightly astringent uses, as an agreeable flavoring agent, as a carminative; as an important source of salicylic acid, hence useful in gouty and rheumatic conditions; sometimes used as an emmenagogue and galactagogue.

(4) *Chimaphila Umbellata*; natural order Ericaceae; common names, pipsissewa, princes' pine, ground holly; constituents, tannic acid, arbutin, chimaphilin, resin, etc.; medical properties, tonic, astringent, diuretic; uses, to stimulate all the excretory organs, especially the kidneys; to aid digestion; as a diuretic in dropsy; to check the excretion of uric acid.

(5) *Epigea Repens*; natural order Ericaceae; common names, trailing arbutus, mountain pink, ground laurel, Mayflower; constituents, tannic acid, arbutin, ericolin, urson, formic acid; medical properties, astringent, diuretic; uses, in all diseases of the urinary organs attended with vesical irritation; lithic acid gravel.

(6) *Kalmia Latifolia*; natural order Ericaceae; common names, laurel, mountain laurel, sheep laurel; constituents, tannic acid, arbutin (in small amount only), andromedotoxin, etc.; medical properties, alterative, astringent, cardiac sedative, antisyphilitic, and in large doses a poisonous narcotic; uses, in syphilis, fevers, inflammations, rheumatism, and functional diseases of the heart.

(7) *Pyrola Rotundifolia*; natural order Ericaceae; common names, canker lettuce, shin-leaf, false wintergreen, pear-leaf wintergreen; constituents, tannic and gallic acids, arbutin, ericolin, urson, resin, and a volatile oil. Medical properties, tonic, astringent, diuretic, antispasmodic; uses,



in diseases of the genito-urinary organs, skin and mucous membranes, convulsions.

(8) *Rhododendron Maximum*; natural order Ericaceae; common names, great laurel, rosebay tree; constituents, tannic and gallic acids, arbutin, ericolin, urson, andromedotoxin; medical properties astringent, diuretic, alterative; uses, as a remedy for obstinate cough in elderly persons, in diphtheritic croup, and in those skin diseases where arsenic is usually employed.

(9) *Rhododendron Ferrugineum*; natural order Ericaceae; common names not stated; constituents, tannic acid, arbutin, ericolin; medical properties and uses can only be inferred from its constituents, as it has been little used.

(10) *Vaccinium Vitis-Idea*; natural order Ericaceae; common names, cowberry, billberry, red whortleberry; constituents not fully known, but contains vaccinin, identical with arbutin; medical properties and uses not given.

#### THEIR ASSOCIATED PRINCIPLES.

(1) *Tannic Acid* ( $C_{14}H_{10}O_9$ ), a faintly yellowish, amorphous, bulky powder; the most common astringent principle of plants.

(2) *Gallic Acid* ( $C_7H_6O_5$  plus  $H_2O$ ), a colorless or slightly yellowish, odorless, astringent powder, slightly acid in taste.

(3) *Arbutin* ( $C_{12}H_{16}O_7$ ), a white, crystalline glucoside, which will be studied more in detail later.

(4) *Ericolin* ( $C_{34}H_{16}O_{21}$ ), an amorphous, yellowish, bitter glucoside, yielding glucose and an essential oil when treated with dilute acids.

(5) *Urson* ( $C_{30}H_{48}O_3$  plus  $H_2O$ ), a resinous, tasteless, crystalline principle.

(6) *Chimaphilin* ( $C_{24}H_{21}O_4$ ), a yellowish, crystalline principle.

(7) *Andromedotoxin* ( $C_{31}H_{51}O_{10}$ ), a neutral, crystalline, narcotic, poisonous principle; more poisonous than strychnine, to which it is antagonistic.

Besides these proximate principles, there are to be found in the arbutin-bearing plants a number of other substances, as fat, wax, gum, resins, acids, and essential oils.

Both tannic acid and arbutin are to be found in each of the ten plants studied, hence all are astringent and diuretic. Ericolin is found in seven, urson in five, and chimaphilin in one; but the properties of these principles have not been fully investigated, and little can be said of their actions and uses. Andromedotoxin appears in two, kalmia and rhododendron maximum, and its narcotic and poisonous properties dominate all the other ingredients, and make the uses of these two plants quite different from those of the others. With the exception of these two, the principal action of all the arbutin-bearing plants is on the genito-urinary organs; while these act more prominently in other directions.

As a class, the arbutin-bearing plants are astringent, diuretic, and tonic in their action; and this statement fairly well covers the field in relation to uva ursi, manzanita, chimaphila, pyrola, epigaea, and perhaps some others. Gaultheria owes its value mainly to its essential oil, the source of the best quality of salicylic acid, which exists in it so abundantly as to overshadow its diuretic properties. Kalmia and rhododendron maximum owe their peculiarities to andromedotoxin; while as to the remainder, not much is known of their properties and uses.

#### THE PROPERTIES AND USES OF ARBUTIN.

(1) Arbutin occurs in long, silky, colorless needles, neutral in reaction, having a bitter taste, very hygroscopic, easily soluble in hot water and alcohol, slightly soluble in cold water, hardly so in ether.

(2) It is not actively toxic, as Van Renterghem took a gram of Merck's crystallized arbutin in one day without any discomfort, and Jablonowski took twenty grams within forty-eight hours without any injurious results.

(3) The special field of arbutin is the mucous membrane of the genito-urinary tract. Its action, however, is not confined to this location, but occurs in a lesser degree on other mucous membranes. It seems to bear the same relation to the mucous membrane of the urinary tract that berberine does to that of the digestive tract; or perhaps bryonin to the serous membranes in general; and like these, its influence is not confined to these particular membranes and localities, but is manifested here more notably than elsewhere.

(4) Brunton considers that it is an astringent, coagulating albumin and constricting the renal cells but not the blood vessels. It lessens the exudation of albumin through the Malpighian tufts of the kidneys in even greater degree than does tannic acid.

(5) On the urinary mucous membrane, the action of arbutin is rather that of a tonic than an astringent, correcting relaxation, checking the discharge of albumin, pus, blood, and mucous, and having a tendency to restore the normal tone to the membrane. It is useful in acute and chronic gonorrhoeas and other catarrhal conditions of the urinary tract. Its action is seen to advantage in the vesical troubles of old men, with frequent micturition and dribbling of fetid, ammoniacal urine.

(6) To a certain extent arbutin acts as an antiseptic, combatting putridity and sepsis, especially in the putrid fermentation of urine.

(7) The predominant action of arbutin, however, is that of a diuretic. In doses of one grain, Hughes found it to be a powerful diuretic. Potter states that it has been successfully employed in cardiac dropsy as a diuretic. Cushny considers that its diuretic action is due to its acting on the renal epithelium, and states that when it is present the urine is found to undergo putrefaction much more slowly than usual.

(8) The specific indication for the use of arbutin is a condition of relaxation and hypersecretion of the urinary mucous membrane. Here it restrains undue secretion and acts as an antiseptic at the same time that it acts as a diuretic.

(9) Arbutin is slow in action, and in order to secure the best results from its use, it is necessary to continue it for a long time. In this respect also it resembles berberine.

(10) The dose of arbutin varies according to the effect which it is desired to produce. As the drug is non-toxic, there is much latitude in the dosage. As given by Merck, it is two and one half grains three or four times a day. As suggested by Abbott, on the basis of "dose enough," it is much smaller, therefore his standard alkaloidal granules contain one sixty-seventh, one sixth, and one grain, respectively, and the usual dose is one granule every fifteen minutes to one hour until effect, after that less frequently as needed to keep up the effect. Personally, I have found the smaller dosage, frequently repeated, most satisfactory for the more common uses of the drug. There is one important class of cases, however, in which the action of arbutin when taken in the larger dosage is remarkable. I refer to gonorrhoeal cystitis and pyelitis. These are among the most distressing cases with which the physician has to deal, and I do not know of any medicine which will cure them as certainly as arbutin, which, however, should be taken in doses of one grain every hour, or in even larger dosage, up to fifteen grains per day, or more.

#### THE RELATION OF ARBUTIN TO THE ARBUTIN-BEARING PLANTS.

A study of arbutin and the plants containing it affords an excellent illustration of the relation of the therapy of the active principles in general to that of the crude drugs from which they are derived. Ellingwood lays down the general principle, which is also endorsed by Abbott, that the therapy of the active principle is one thing, and that of the crude drug is another, and each must be studied by itself. The truth of this is evident in the present instance. The therapy of arbutin is one thing, and that of *uva ursi* is another, and the same is true of each of the arbutin-bearing plants.

Nevertheless it is equally true that the keynote to the most important uses of the *Ericaceae* in general is to be found in arbutin; and also that there are marked advantages in the use of the active principle over that of any of the plants containing it, in a large class of cases, since in the latter case the desired medicinal action is either disguised or modified by the large amount of extraneous material with which it is combined, and which often produces an undesirable effect. Whereas, by the use of arbutin, the dose required is small, the effect is single, definite, and positive — and here are no unpleasant by-effects.

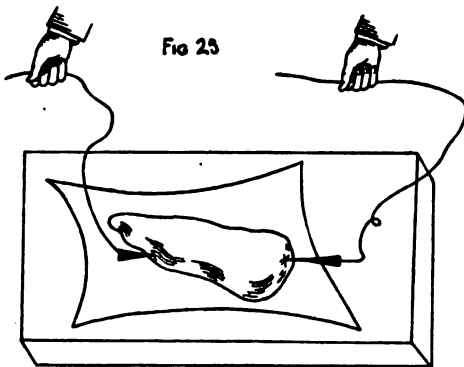
**PHYSICAL THERAPY.****FIRST STEPS IN MEDICAL ELECTRICITY.**

BY HERBERT MCINTOSH, A.M., M.D., BOSTON, MASS.

**CHAPTER IV.****PHYSIOLOGY OF THE DIRECT CURRENT.***Polar Effects, Cataphoresis, Interpolar Effects.*

HAVING in the two previous chapters studied inductively the physics of the direct current and the physics of coil currents, we are now to consider by the same method the effect of the direct current upon animal tissue.

If a current of about two hundred milliamperes be allowed to pass into a piece of beef muscle for two or three minutes by means of two steel needles,



one connected with the positive and the other with the negative pole of a galvanic battery, a peculiar hissing noise is heard which appears to proceed from the negative pole, and is caused partly by the escape of bubbles of hydrogen along the track of the needle connected with that pole.

Upon opening the circuit it is found that the needle connected with the negative pole

is easily withdrawn, while that connected with the positive pole adheres to the tissues, and is withdrawn with difficulty.

If an incision be made into the muscle around the negative pole it is found that the tissues are soft and infiltrated, to some extent destroyed, and of darker color, and that the needle occupies a cavity filled with fluid and bubbles, and remains bright and untarnished.

A similar incision into the muscle around the positive pole reveals hardened tissues, which have been darkened by the iron dissolved from the needle, and dehydrated by the gas which is developed by the current. The needle is darkened and corroded.

If a piece of reddened litmus paper is placed in the froth surrounding the needle connected with the negative pole and the circuit again closed, the paper will soon turn blue; in like manner if a piece of blue litmus paper be placed in contact with an uncorroded platinum needle connected with the positive pole, the paper will turn red.

From this simple experiment we observe a number of important differences between the behavior of the positive and the negative pole, which may be briefly summarized thus:

(1) *The fluids about the positive pole are acid; those about the negative pole are alkaline.*

(2) *The gas generated at the positive pole is oxygen; that at the negative pole is hydrogen.* (Vide Chapter II, Electrolysis, Fig. 9.)

(3) *The tissues around the positive pole are hardened by acids; the tissues around the negative pole are partially destroyed by alkalies.*

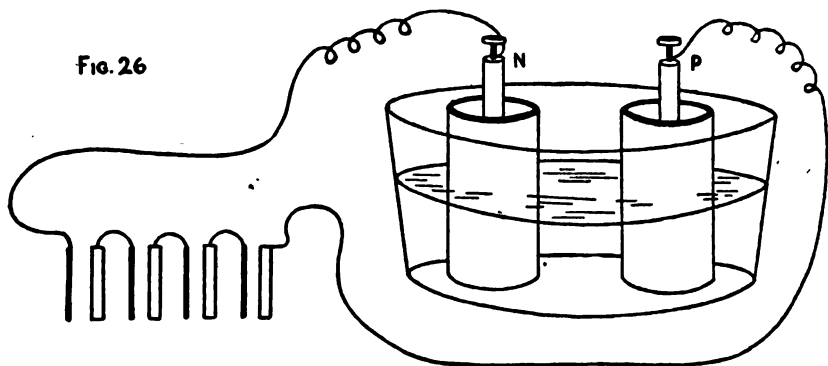
(4) It was noted that the needle attached to the positive pole had a tendency to adhere to the tissues; the needle connected with the negative pole was easily withdrawn. The former, therefore, had a dehydrating effect upon tissue, the latter an infiltrating effect. From this we may provisionally infer that the positive pole in living tissue lessens congestion and checks hemorrhage; the negative pole improves nutrition and dilates circulatory channels.

Therefore,

(5) *The positive pole is a vasomotor contractor; the negative pole is a vasomotor dilator*, congestion or stasis being due, at least partially, to a relaxation of vasomotor control, and hemostasis, in some measure, to increased tonicity of vasomotor nerves.

If it be objected that it is not safe to apply conclusions drawn from the behavior of the electric current on dead tissue to its action upon living tissue, it may be replied that experimental research in electro-physiology would seem to warrant the soundness of the inferences contained in (4) and (5).

*Cataphoresis.*—If two porous cups be placed in a vessel containing water, and filled to an equal height with the same fluid, and the positive pole of a galvanic battery introduced into one of the cups and the negative into the other, upon closing the circuit it will be observed, after a short time, that the fluid in the cup containing the positive pole has been reduced while that in the cup containing the negative pole has been increased.



That this is not purely an osmotic process, that is to say, the passage of a fluid of lighter density through an animal membrane into a fluid of heavier density, may be easily shown by placing the positive pole in a fluid of heavier density, which will then be carried in an opposite direction into the fluid of lighter density. This physical transference of fluid by the electric current is called *cataphoresis*, and is shown experimentally above in the dehydration of tissues around the positive pole in the experiment with the beef muscle.

It was noted above in the same experiment that the needle attached to the positive pole was no longer bright and shining, but was dark and corroded, and that the tissues in the immediate neighborhood were of a darker color. If a copper electrode had been used the tissues would have been stained green. Platinum alone seems to resist the chemical action manifested at the positive pole. This destructive process, in consequence of which ions are detached from the positive pole, and associated with other ions similarly detached from their fellows, forming new compounds called oxides and oxy-chlorides of the metals attacked, is called *electrolysis*, which by derivation is a tearing apart by electricity, and is identical with the process described in Chapter II, on the physics of the direct current, in which water is decomposed into its constituent parts, though in that case new compounds were not formed by the detached ions.

Ions are divided into two classes — electro-positive and electro-negative. The former are attracted to the negative pole and are those called *kations*; the latter to the positive and are therefore called *anions*, as ions of like polarity repel, and those of unlike polarity attract each other. In general the metals, hydrogen, and the alkalies are electro-positive; oxygen, chlorine, and the acids are electro-negative. In the above experiment, if we put a solution of potassium iodide in one cup and a mixture of starch and water in the other, and drop a wire attached to the negative pole in the former, and a similar wire attached to the positive pole in the latter, upon closing the circuit we shall note after a while a blue color in the cup containing the starch water, due to the electrolytic decomposition of the potassium iodide, and the cataphoric transfer of the dissociated iodine, which strikes a blue color with the starch.

From these experiments we may infer that cataphoresis is a double process and consists of

- (1) A physical transference of fluids as above illustrated, and
- (2) An electrolytic decomposition of substances through which the current passes.

We have thus explained a further difference between the action of the positive and the negative pole, *viz*:

- (6) *The positive pole is dehydrating and desiccating; the negative pole is infiltrating.*

One need, therefore, never be at a loss in selecting the pole upon which

a medicament is to be placed for medicamental cataphoresis. If it be desired to introduce cocaine hydrochloride into the tissues, the solution should be placed upon the positive pole, as the alkaloidal base is electro-positive, and an electro-positive ion is attracted to the negative pole. If, however, a solution of potassium iodide is chosen for diffusion, it should be placed upon the negative pole, because iodine is electro-negative, and consequently seeks the positive pole.

*Katelectrotonus and Anelectrotonus.*—As a possible, though not adequately demonstrated consequence of the cataphoric action of the galvanic current, we have the phenomenon called *katelectrotonus*, which is the increased excitability of the tissues in the neighborhood of the negative pole.

A corresponding decrease in the excitability of the tissues in the neighborhood of the positive pole is called *anelectrotonus*.

While the infiltrations of the tissues about the negative pole may be a partial explanation of the increased sensibility at that point, it has been urged that in animal tissues an increased alkalinity accompanies inflammations, while an acid condition leads to sedation and anesthesia, because the latter precedes a lowered tonicity, and eventually leads to destruction of the parts affected.

To the differences, therefore, already noted in the action of the positive and the negative pole we may consequently add another, *viz*:

(7) *The positive pole is sedative, the negative is irritating.*

Elaborate experiments with the galvanic current have proved that the positive pole in strengths above fifty milliamperes is bactericidal, though with lower strengths it is not only non-bactericidal, but, through the addition of oxygen to cultures of bacteria, may even promote their growth. As, however, below these strengths it is very easy to employ metallic cataphoresis, it still remains true, for practical purposes, that the positive pole is bactericidal. Similar experiments have proved that the negative pole exerts no influence upon the vigor of cultures. We may therefore add a further deduction, *viz*:—

(8) *The positive pole is bactericidal, the negative pole is non-bactericidal.*

*Interpolar effects.* Having now considered more particularly the polar currents, let us turn our attention to what takes place in the interpolar regions, or the regions between the poles.

Experiments, which unfortunately are too elaborate for reproduction in the space assigned to these chapters, prove conclusively that in tissues of variable resistance, such as those constituting the human body, the currents do not pass in straight lines between the poles, but in lines similar to those drawn in Fig. 27.

Immediately beneath the poles and extending for some distance into the tissues, the effects described above as characteristic of the poles may be expected. In the interpolar spaces the effects to be ex-

pected would depend upon electrolysis, cataphoresis, vasomotor stimulations and contractions in non-striated tissues produced by heavy currents.

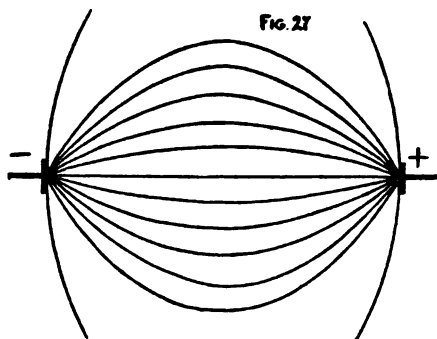


FIG. 27

The fluids of the body contain in solution, sodium chloride, calcium phosphate, calcium carbonate, magnesium phosphate, potassium chloride, sodium and potassium phosphate, sodium and potassium carbonate, and sodium and potassium sulphate. It can therefore

very readily be seen that, in traversing the human tissues saturated in fluids holding the above salts in solution, the electric current must of necessity expend itself largely in dissociating molecules from their usual combinations, rendering the detached ions "nascent" and thus increasing the activity of metabolic processes, which in many conditions of impaired health are below their normal level.

Take, for example, sodium chloride. In the blood it is nearly as abundant as all the other mineral ingredients together. One of the most frequent chemical reactions in the tissues is doubtless represented by the following equation:  $\text{H}_2\text{O} + \text{NaCl} = \text{HCl} + \text{NaOH}$ , in which hydrochloric acid and sodium hydrate are produced by the interchange of the molecules of water and common salt. This may fairly be taken as a type of chemical interchange produced by the interpolar action of the electric current, and, as it is believed that chemical affinity and electrical attraction are identical, it may readily be seen that the disintegrations and recombinations of salts in solution in the tissues are a necessary accompaniment of the progress of the electric current through the body, the nascent energy thus developed heightening metabolism and promoting elimination.

There is, however, not simply a disintegration and recombination of molecules as typified in the above reaction, but there is also an actual physical movement of fluid in the interpolar spaces under the impelling influence of the electric current. The interpolar action is, therefore, made up of the two elements constituting cataphoresis, namely, physical transfer of fluids and electrolytic decomposition of substances.

Or we may take, as a further illustration, the salt potassium chloride, which is abundantly found in the tissues, especially in the muscles. Under the influence of the electric current we may suppose that the following reaction takes place:  $\text{KCl} + \text{H}_2\text{O} = \text{HCl} + \text{KOH}$ , in which we obtain one molecule of hydrochloric acid and one molecule of potassium hydrate.

Or if we consider sodium sulphate, of which a somewhat minute proportion exists in the tissues, we shall obtain the following electrolysis:



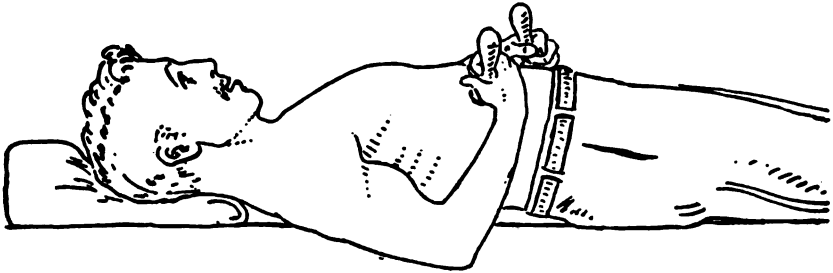
$\text{Na}_2\text{SO}_4 + \text{H}_2\text{O} = \text{H}_2\text{SO}_4 + \text{Na}_2\text{O}$ , in which the new products are sulphuric acid and oxide of sodium.

The  $\text{Na}_2\text{O}$ , however, being somewhat unstable, we may assume that by combination with another molecule we obtain the following reaction:  $\text{Na}_2 + \text{H}_2\text{O} = 2\text{NaOH}$ , or two molecules of sodium hydrate.

In these illustrations of interpolar processes we note the formation of acids and alkalies, which tend by their attractions to move toward the poles for which they have an affinity, the alkalies proceeding to the negative pole, the acid radicle and acids to the positive pole.

If the poles of a galvanic battery be placed upon the abdomen (Fig. 28), the positive over one rectus muscle and the negative over the other, and an interrupted current of sufficient volume be allowed to pass through the circuit, it will be noted at once that the muscles powerfully contract.

Fig. 28.



What is true of striated muscular tissue is equally true of the non-striated, since both varieties are susceptible to electrical stimulation, so that we may fairly infer that an interrupted galvanic current of suitable strength by its contractile effect upon muscular tissue would relieve stasis and promote drainage in the lymphatic spaces, stimulate the muscular coats of arteries and intestines, and generally promote metabolism.

It will be noted in bringing this chapter on the physiology of the direct current to a close, that probably all the conclusions reached have been inferred from the simple experiment with the beef muscle taken in conjunction with the principles of electro-physics already explained, and that it has not been a difficult task to ascertain facts of the utmost importance in electro-therapeutics by the employment of simple and inexpensive methods.

Erratum. On page 276 of the June issue, the thirteenth line, "increases" should read "decreases."

(To be continued.)

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Who shuts his hand, hath lost his gold;  
Who opens it, hath it twice told. — *George Herbert.*

# DEPARTMENT OF DIETETICS

## THE DIETETICS OF SUGAR

BY J. A. DENKINGER, M.D., BOSTON, MASS.

THE diet of the average individual is composed of fully three fifths if not three fourths of carbohydrate material,— starch and sugar,— all of which must be changed into simple sugars (monosaccharides) before it can be absorbed. This fact alone makes the subject of sugar in the diet in both health and disease of the greatest importance. Unfortunately, authorities, and this applies to physiologists as well as to clinicians, differ still widely on many essential points involved in the subject forming the title of this paper.

In his excellent work on "Diseases of the Stomach," Boardman Reed makes the statement "that the place of sugar in the diet is one of the most difficult points in the whole subject of dietetics which itself comprises perhaps the most difficult, complicated, and as yet unsettled part of practical medicine."

An examination of the literature of the subject amply confirms Dr. Reed's opinion.

Before taking up the dietetics of sugar in health and disease, I think it is well to review the most recent teachings respecting the physiology of carbohydrates and the individual characteristics of those forms of sugar in general use.

Carbohydrates include the two closely related classes of compounds,— starches and sugars, composed of carbon, hydrogen, and oxygen, but free from nitrogen, for which reason they are classified as non-nitrogenous foods. They are found chiefly in the vegetable tissues, but some are found in or are formed by the animal organism. The most important of these are glycogen or animal starch, dextrose, and lactose.

Carbohydrates cannot serve as tissue builders, but by oxidation they yield energy for heat and work. As proteid spacers they are superior to fats and constitute by far our most economical food stuffs, both physiologically and financially.

The carbohydrates used as food are classified as follows:

- 1st. The monosaccharides or simple sugars, which include dextrose, levulose, and galactose.
- 2d. The disaccharides, or double sugars, which include saccharose (cane sugar), lactose, and maltose.
- 3d. The polysaccharides, which include starch, glycogen, dextrin, and cellulose.

The monosaccharides or physiological sugars (Chittenden), or pre-digested sugars (Thompson) cannot be broken down into simpler sugars, and for this reason are often referred to as simple sugars. They are sweet, but not as sweet as some of the double sugars (disaccharides). The monosaccharides are not changed by the digestive processes and are directly absorbed and available for the nutritive purposes of the body. All digestible carbohydrates are converted into monosaccharides before they can be absorbed and utilized. The monosaccharides are directly fermentable with yeast, yielding chiefly alcohol and carbon dioxide.

The disaccharides, when treated with diluted acids or acted upon by the inverting ferments, break down into two monosaccharides. The disaccharides as such are not directly fermentable, but become so readily after inversion. Maltose, lactose, and cane sugar have the same chemical formula. The polysaccharides have little resemblance to sugar and are not sweet in taste, and form simple sugars only after several reactions.

*Starch.* The great bulk of the carbohydrate material consumed by man is in the form of starch. It is widely distributed throughout the vegetable kingdom, being particularly abundant in the various cereals, fruits, and tubers. The conversion of starch (an insoluble carbohydrate) into soluble carbohydrates is accomplished in several ways, as by dry heat (baking), of which toast is an example, or by the addition of dilute acids. In the body the conversion of starch into sugar is brought about by an amylolytic enzyme known as amylase (diastase, ptyalin, amylopsin). This enzyme is found in both the salivary and pancreatic secretions, and has the power to transform starch by a series of progressive changes, first into soluble starch (amidulin or amylo-dextrine) followed in succession by a series of dextrans (erythro-dextrin, achroö-dextrin, and malto-dextrin) with the sugar maltose as the chief end product. Upon boiling a starch solution with a dilute mineral acid, a series of similar bodies are formed, but under these conditions *dextrose*, not maltose, is the principal end product.

Amylase (or diastase as it is called by the earlier writers) is also found in all germinating cereals. Commercially it is obtained from germinating malt, especially barley-malt, which contains this enzyme in enormous quantity. According to most authorities, there seems to be no qualitative difference in the amylase obtained from different sources. Quantitatively, pancreatic amylase (amylopsin) acts very much more powerfully than salivary amylase (ptyalin), but this is due to the greater concentration of the pancreatic ferment. Amylase acts best in a neutral, faintly alkaline or faintly acid medium; strong acid or alkaline media reduce its activity very materially, and in high concentrations bring it to a standstill. The acid ordinarily found in the stomach is sufficient to stop the activity of the ferment, but the latter continues to act for some time, especially in the cardiac end of the stomach.

*Dextrin.* Dextrin is an intermediate product in the conversion of

starch into maltose or dextrose by heating starch, as in baking, or by the action of weak acids or by the ferment amylase contained in the saliva, the pancreatic juice or in diastasic malt. It is more closely related to starch than to sugar, although very soluble in water, and is not laxative in action even in strong solutions.

*Maltose.* Maltose (malt sugar) is the sugar formed by the action of the ferment amylase (ptyalin, amylopsin, diastase) in the hydrolysis of starch. It is also formed as an intermediate product in the action of dilute acids upon starch paste, but in this case the maltose is itself converted into dextrose. Maltose is the chief end product of the action of malt diastase contained in sprouting barley or malt and of diastasic ferments wherever found, upon starch.

### IS MALTOSÉ DIRECTLY FERMENTABLE ?

Such writers as Hammarsten, Halliburton, Simon, Boas, Lippmann, Sadtler, and Bartley state that maltose ferments readily and completely with yeast. According to Allen, one of our most eminent authorities, "maltose is probably incapable of direct fermentation, but by the continued action of yeast its conversion to dextrose and fermentation go on simultaneously." According to Long "maltose is not directly fermentable, but an inverting enzyme in common yeast changes it so quickly that it was long classed among the true fermentable sugars." The view is now generally accepted that the disaccharides must first be converted into monosaccharides before real fermentation takes place. Halliburton calls maltose, lactose, and dextrose the three important physiological sugars. Maltose, unlike cane sugar, is a natural product, the result of starch digestion in the body, and may be justly regarded as a partially digested form of carbohydrate. According to Effront, one of our greatest authorities on maltose, "maltose is a nutritive substance of great value. In the living organism it is transformed into assimilable sugar more rapidly than saccharose (cane sugar). It is very easy to digest, and having not so sweet a taste as cane sugar, it can be taken in much greater quantities than the latter." I have found that maltose is not as liable to cause gastro-intestinal disturbances as cane sugar, unless taken greatly in excess or in too concentrated a form. Maltose is one of the chief constituents of the various malted foods, which according to Sollmann ("Textbook of Pharmacology") are superior to glucose and cane sugar, as they cause less gastric irritation.

*Maltose versus Glucose.* According to Effront, maltose affords very great advantages over glucose, especially in point of purity.

"By the action of acids on starch, industrial glucoses are obtained, which contain besides dextrin, foreign bodies formed under the influence of the acids at high temperature. These bodies give a disagreeable taste

to glucoses and often possess poisonous properties. The dextrins formed under the influence of acids have also a scant nutritive value. The pancreatic juice acts very slowly on these dextrins and its action is always incomplete. The maltose industry furnishes a more wholesome and more nutritive malt than that furnished by the glucose industry. It is therefore indisputable from a hygienic standpoint that maltose is preferable to glucose."

Ordinarily maltose is not absorbed as such, but is changed into dextrose by an inverting ferment, known as maltase or glucase. This enzyme also acts upon starch and dextrin, but more particularly upon maltose. It is found in malt, in various yeasts, even the saliva contains a little, but it is chiefly found in the pancreas and in the intestinal juice. Maltase is also found in the blood to convert directly absorbed maltose into dextrose, for maltose to be assimilated by living cells must be transformed into glucose (dextrose). I will have more to say regarding maltose when we come to the subject of "sugar in infant feeding."

*Saccharose (sucrose, cane sugar).* Cane sugar, as this type of sugar is commonly called, is to-day the most extensively used form of sugar. The sugar cane and sugar beet, and to a less extent the sugar maple and the date palm, supply nearly all the saccharose of commerce. Contrary to general opinion, there are no chemical tests by which pure crystallized saccharose obtained from the sugar cane can be distinguished from beet sugar, and it is not true that sugar from the beet is more injurious to health than sugar from the sugar cane. Cane sugar does not ferment directly with pure yeast, "but by prolonged action of common yeast on a dilute solution of the sugar, fermentation appears" (Long). This is due to the fact that the crude yeast contains an inverting ferment (invertase or invertin) which splits saccharose into a mixture of two monosaccharides, known as invert sugar, consisting of equal parts of dextrose and levulose, which then yielded to the true fermentation. This inversion may be produced by simple boiling, or by boiling with weak acids, as well as by means of ferments and bacteria. In the body, most of the cane sugar ingested remains unchanged until it comes in contact with the invertase of the intestinal juice.

*Maple Sugar.* The sugar maple of North America is said to produce now fully eight million pounds of sugar per year. It differs from other forms of saccharose only on account of its peculiar and to most people agreeable flavor, which latter is, however, so completely lost by the various processes of refinement that it cannot be distinguished from refined cane sugar. Maple sugar is said to be more laxative than cane sugar. The same applies to brown sugar, and is probably due to impurities. Brown sugar and maple sugar contain only about ninety-seven per cent pure saccharose, whereas refined cane sugar and beet sugar contain ninety-eight per cent of pure saccharose.

Mrs. Abel, author of "Sugar as Food" (Farmers' Bulletin, No. 93)

quotes an interesting paragraph from a book written by the eminent Robert Boyle, and printed at Oxford in 1663: "There is in some parts of New England a kind of tree . . . whose juice that weeps out of its incisions, if it be permitted slowly to exhale away the superfluous moisture, doth congeal into a sweet and saccharine substance, and the like was confirmed to me by the agent of the great and populous colony of Massachusetts."

### IS THE USE OF CANE SUGAR INJURIOUS?

Cane sugar is fully two and one half times as sweet as dextrose. Unlike the physiological sugars — maltose, lactose, and dextrose (Halliburton)— cane sugar is a man-made product, differing quite materially from its natural state, the sugar cane or sugar beet, in point of concentration. It has been noted by various observers that cane sugar gives rise to a far more acid gastric juice and more mucus in the stomach than other sugars, and as having a more irritating effect on mucous membrane wherever located, than lactose, maltose, dextrose, or honey.

"Cane sugar may easily interfere with the digestion of other foods by reason of the great outpouring of mucus in the stomach which its presence induces" (Hutchison).

According to many authorities, cane sugar has a large share in the increase of stomach disorders, for which reason they consider it wise to minimize the use of cane sugar in dyspepsia and other stomach disorders. While I believe that cane sugar is more liable to cause gastro-intestinal disturbances than the other disaccharides, I also believe that much of the bad repute of cane sugar is due to excessive ingestion of it or taking it in too concentrated a solution. Thorough insalivation of concentrated sweets, such as candy before swallowing, would also tend to render cane sugar less harmful, for which reason candy, such as toffee, requiring more or less chewing and insalivation, is preferable to candy or other sweets that are promptly swallowed without chewing or insalivation.

*Lactose (milk sugar).* Lactose is an ingredient of the milk of mammals, and is prepared chiefly from cows' milk, by evaporating the whey after removing the curd for the manufacture of cheese. It is only about one third as sweet as cane sugar, has a gritty taste, and is very much less soluble than the other sugars. Lactose undergoes lactic acid fermentation more readily than other sugars. In the alimentary canal this reaction occurs as the result of the action of a series of micro-organisms. In the souring of milk the bacterium lactis and certain other micro-organisms bring it about by transforming the lactose into lactic acid and alcohol. In the preparation of Kephir and Koumyss, the lactose of the milk undergoes alcoholic fermentation through the action of ferments other than yeast, lactic acid being formed at the same time (Hawk).

Lactose is not fermentable by pure yeast and ferments very slowly with common yeast and only after being split into the monosaccharides dextrose and galactose by the ferment lactase found in several kinds of yeast and in the intestinal juice.

*Dextrose (glucose).* Also known as sucro-dextrose, dextro-glucose, grapesugar, starch sugar, diabetic sugar. Dextrose is widely distributed throughout the vegetable kingdom. Grapes contain about fifteen per cent of dextrose. In honey and in most sweet fruits it is found mixed with levulose. In some fruits, such as apples, apricots, peaches, and pineapples, as well as strawberries, it is found mixed with cane sugar as well as levulose. It is found in small quantities in the blood and lymph and as traces in other animal fluids and tissues (Hammarsten). Dextrose is the sugar found in diabetic urine, hence its name diabetic sugar. It is much less sweet than cane sugar. Dextrose is by far the most assimilable of all sugars, even under the most unfavorable conditions (Mendel). Dextrose and levulose are capable of direct assimilation after subcutaneous injection. Dextrose readily undergoes alcoholic fermentation with yeast, also lactic and butyric fermentation. Either directly or indirectly, dextrose becomes the predominating sugar of the alimentary tract, being the ultimate product of the decomposition of every polysaccharide and disaccharide (Fisher).

(To be continued)

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## Obituary

KENT O. FOLTZ, M.D., was born at Lafayette, Ohio, February 16, 1857, and died at the Seton Hospital in Cincinnati, June 6, 1908, of acute nephritis. He graduated from the Ashland High School in 1872, afterwards attending Buchtel College at Akron, Ohio. Subsequently he made a special study of chemistry and botany, spending several years in the drug business. Later he attended the Western Reserve Medical School in Cleveland, and the Eclectic Medical Institute, graduating from the latter in 1886.

He attended several post graduate courses on the Eye, Ear, Nose, and Throat in New York City. After several years of general practice, he was elected to the Chair of Diseases of the Eye, Ear, Nose, and Throat in the Eclectic Medical Institute at Cincinnati, which position he filled very creditably for the past ten years. He was President of the Ohio State Eclectic Medical Society, and a member of the National and Cincinnati Societies, and Associate Editor of the Eclectic Medical Journal. He was consulting physician on the Staff of the Seton Hospital. He was the author of two works, one on the Disease of the Eye, the other on the Nose, Throat, and Ear.

# EDITORIALS

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PITTS EDWIN HOWES, M.D., EDITOR.

JOHN MARSHALL FRENCH, M.D., ASSOCIATE EDITOR.

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### THE EXPECTANT METHOD OF TREATMENT.

THE expectant method of treatment is one which watches and waits, doing nothing in the way of medication any faster than the necessity for that particular form of medication forces itself upon the attention — which it calls treating symptoms as they arise. It does not believe in the possibility of aborting disease, and makes no effort to anticipate its course or modify its manifestations in advance of their appearance. It looks upon disease in general as a self-limited process, and considers that the chief function of the physician in relation to it is to stand guard and see that the fight is a fair one, and that each side lives up to the rules of the game.

It reasons, for example, that there is no use in giving intestinal antiseptics in a case of typhoid fever with a view to lessening the severity of the infection or shortening the course of the disease, because it is impossible to render the intestinal canal completely aseptic, and hence the malady is bound to run its course in spite of all that can be done. Besides, there is no absolute certainty that the disease would run a severe course even if there was no attempt at medication.

It does not believe in interfering with the fever process, per se, for it looks upon this as nature's method of working off the disease; but, should



the fever reach a dangerous height, as a last resort it might be admissible to apply cold baths: only rarely to give drugs internally.

It does not admit the wisdom of giving heart tonics in pneumonia until the heart has already shown signs of weakness and impending failure, because it considers that there is no use in treating a condition which does not exist; though of what use it can be to study the natural history of disease, if not for the sake of being able to take advantage of its known course and constant symptoms, to anticipate and ward off the dangers which are sure to come, is more than the common mind can understand.

It concerns itself greatly about accurate diagnosis, which it deems the most important study of the physician, and troubles itself very little with drug treatment, which it considers a minor matter, and the refuge of weak minds.

The expectant treatment is the running mate of therapeutic nihilism, and both of these find their best exemplar in Professor Osler, whose remark not long ago to his London students that "he is the best doctor who knows the worthlessness of most drugs," shows his own ignorance of drugs, and sounds very much as if one were to say that he is the best carpenter who knows the uselessness of the most of the tools which he uses, or that he is the best soldier who has learned the uselessness of gunpowder.

It prides itself on the correctness of its diagnosis — and incidentally its prognosis — as shown by the autopsy; regardless of the fact that most patients would prefer a mistaken diagnosis to this means of proof.

It does not believe in the utility of drugs as curative agents, and its therapeutic armamentarium is confined mainly to the four "old-timers," alcohol, opium, quinine, and calomel. This is because the method originated in the old times, and has never progressed to any extent. But if it is in the hands of a surgeon, who prides himself in being up to date, it shows its modernity by adding to these, epsom salts.

But fortunately the popularity of the expectant method is a thing of the past, and our strongest men to-day are therapeutic optimists, and advocates of a positive treatment of disease. In a recent address before the Medical Society of the State of New York, Dr. Jacobi declared that the expectant treatment is too often a compound of indolence and ignorance, and cited many cases where patients who had been condemned to death or protracted invalidism by the believer in the expectant treatment and therapeutic nihilism were saved and restored to health by proper medication. "Expectant treatment!" he exclaims, "Verily I tell you, it is malpractice, which should be punished on account of neglecting what nature and sound therapeutics furnish. Expectant treatment is no treatment. It is a sin of omission, which not infrequently rises to the dignity of a crime."

Dr. Jacobi strikes at the root of the whole matter when he declares the basis of both therapeutic nihilism and the expectant treatment is to

be found in indolence and ignorance. It is the man who does not know how to use drugs, who has never studied their uses with proper care, and hence is not able to administer them to advantage, who is continually crying out that drugs are of no value. ~~They~~ have heard physicians say that their faith in drugs grew less with each year of their practice. But what would you say of a mechanic who should tell you that he had less confidence in his tools the longer he used them? Either he must have poor tools, or he is an incompetent workman. A good mechanic ought to be able to do better work with his tools each year of his use of them. On this point Dr. Jacobi says: "When you meet an old doctor who tells you he gives no drug, or a young one who was born old, who uses no cold water, no massage, on account of their alleged uselessness, he belongs to the class which remained in the rear, away from the battlefield of the army of explorers and fighters, or that unlucky class whose brain was first in falling victim to insidious atherometosis. We are all human and subject to the laws of nature, which is indifferent to whether she preserves full manhood in one and makes an object of pity of the other. They say we are fearfully and wonderfully made. Some wonderfully and some fearfully."

"It is not in our stars, but in ourselves, that we are underlings," says the great dramatist. And in the same way it is not in our drugs, but in ourselves, that we are unsuccessful physicians. The trouble with the most of us is that we use too many drugs and study them too little. It is better to carry a pocket case full of remedies which we know intimately and at first hand, and can use with confidence that we shall get results than to have whole volumes full of the favorite prescriptions of other men, or a drug store filled with remedies "which have been used with advantage."

To be sure, we cannot cure the incurable. Where there is no vitality there is no reaction. At the last all men must die. But it is the doctor's duty to postpone the dread day to the latest possible moment, and to make life endurable while it lasts; to heal the sick, to relieve the suffering, and to lengthen life. To do this he must learn to know thoroughly the drugs he uses, so that he can handle them to the best possible advantage, and he must have confidence that they will give him results. When he has reached this point he will have forgotten the dogmas of therapeutic nihilism, and will have very little use for the expectant method of treatment.

It was Bartholow who said, a generation ago, "He who despises his art can never become a great artist. Good practitioners are always found to be men entertaining the greatest confidence in the powers of medicine."

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BOOK REVIEWS—A number of book reviews which are crowded out of this issue will appear next month.

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## SOME REMEDIES INDICATED BY THE PULSE

*Spec. Med. Aconite.*— When you find a small, frequent pulse combined with skin that is hot and dry with an increased temperature this remedy will be found useful. It should be used in small doses. Two to five drops of the Spec. Med. should be added to four ounces of water and a teaspoonful of this mixture given every half to every two hours according to the severity of the case.

*Spec. Med. Asclepias Tub.*— Where there is increased temperature, with an inclination to moisture of the skin, and sharp pain that is rendered more severe by movement, together with a pulse that is strong and vibratile ten to twenty drops of this remedy, well diluted with water, will prove valuable in restoring the normal condition.

*Tinct. Capsicum.*— If the pulse presented for examination is smaller and weak, and the extremities and skin are cool with pallid lips, the tincture of capsicum will prove very efficient. Give in doses of one half to ten drops every fifteen minutes to every two hours according to the need of rapid stimulation. This agent will act more rapidly if given in *hot water*.

*Spec. Med. Veratrum Vir.*— A frequent, full and bounding pulse, with strong tension upon the arteries and an increased temperature calls for this drug. Ten to twenty drops of the Spec. Med. should be added to four ounces of water and given in drachm doses every half hour to every two hours. The smaller dose more frequently repeated is preferable.

*Spec. Med. Rhus. Tox.*— Sometimes you will meet a small, quick, and sharp pulse, with much restlessness, which is associated with a tongue of red color and covered with prominent papillæ. Such a combination calls for Rhus Tox. If you use the Spec. Med. add five to ten drops to water four ounces, and administer drachm doses every one or two hours.

*Spec. Med. Cactus.*— A feeble and irregular pulse that is increased in frequency and irregularity in the heart's action — a nervous pulse — demands the use of this remedy. Add ten to thirty drops to four ounces of water, and give drachm doses every two hours.

*Fowler's Solution — Arsenic.*— If your patient shows you a pulse that is feeble, soft, and easily compressed, with dead, inelastic skin, and cool arms and legs, this drug will do you good service. It may be administered in fraction of a drop doses. Add ten to fifteen drops to four ounces of water and give drachm doses every three hours.

# DEPARTMENT OF THERAPEUTICS

## SAMBUCUS CANADENSIS

By J. M. FRENCH, M.D., MILFORD, MASS.

*SAMBUCUS CANADENSIS*, the common American elder, natural order *Caprifoliaceae*, is a common native shrub growing to a height of from five to twelve feet, and having a stem which is filled with a light and porous pith. The leaves are nearly bipinnate, the leaflets in three or four pairs with an odd one. The flowers are numerous, white, and occur in large, level-topped, five-parted cymes, having a heavy odor. The fruit consists of numerous purplish-black berries. It grows in all parts of the United States, abounding in low, damp grounds, hedgerows, thickets, and waste places. It flowers from May to July, and ripens its berries in September and October. The parts used in medicine are the flowers, the fruit, and the fresh inner bark. In eclectic medicine, the latter is preferred.

The elder is an example of a numerous class of common plants, which, while not possessing medicinal properties of the highest value, are yet of sufficient importance to warrant a more careful study of their actions and uses than has usually been given them. Some of these plants have properties which enable them to meet certain single definite conditions better than almost or quite any other agent known; others will fulfil a number of common indications fairly well, though none of them, perhaps, in the best possible way. Both classes are worth studying, though the first is the most important. What we greatly want is the best agent in single conditions.

Scudder says the elder is a stimulant to all the excretory organs, increasing secretion. It may be employed for the general purposes of an alterative, increasing waste, in syphilis, scrofula, and other diseases attended by deposits or depravation of tissues. It is especially useful in those cases where there is an oedematous condition, or fulness of tissues from an increased amount of water. It may be employed in dropsy, though its action is not so decided as that of *apocynum*. As a local application he considers it specific to those eruptions that arise on a full tissue, as above, and are attended with an abundant serous discharge. Thus in some forms of eczema, in indolent ulcers, and in mucous patches with free secretion, an ointment made by simmering the inner bark of the elder in fresh butter is an excellent application. Or if preferred, the official glycerole may be employed instead of the ointment.

Ellingwood considers its specific symptomatology to be in skin diseases characterized by the formation of blebs and blisters, and which contain serum, discharging when mature, and leaving crusts. Its chief therapeutical use aside from the above is in dropsical conditions, especially in that form of dropsy which follows scarletina and measles. It is an alterative remedy with a field peculiarly its own.

Webster states that in catarrhal obstruction of the nasal passages of infants, small doses of this remedy are curative. Externally it is applied in eruptions and burns, in some forms of eczema, old ulcers, and salt rheum.

Felter and Lloyd regard the elder as stimulant to all the secretions. When drank in warm infusion, it is diaphoretic and gently stimulant; in cold infusion, it is diuretic, alterative, and cooling, and is of use in all diseases requiring such actions, as in derangements of the liver in children, in erysipelas and erysipelatous diseases, and the like. The expressed juice of the fresh berries, boiled down to the consistency of a syrup, is of value as an aperient and an alterative. One ounce of it will purge. So also will an infusion of the young leaf-buds. The flowers and the expressed juice of the berries are beneficial in scrofula, skin diseases, rheumatism, syphilis, etc. The inner green bark is purgative in moderate doses, emetic in large ones. The chief indication for sambucus is a fulness or oedematous condition of the parts, giving them a watery and flabby appearance. When these conditions exist, it is a valuable agent in dropsy. Externally, sambucus is a valuable agent, especially for eruptions appearing upon the full, flabby, oedematous tissues already described, and particularly when attended with an abundant discharge of serum. Beaten up with lard or cream, it makes a good ointment in burns, scalds, and some forms of skin diseases, such as eczema, milk-scald, old ulcers, and mucous patches.

Comparing these different studies of *sambucus canadensis*, we find that there are at least three indications in which there is a general agreement, as follows:

- (1) In dropsical conditions, characterized by a fulness and oedematous condition of the parts, giving them a watery and flabby appearance. Also in the dropsy which follows scarlet fever and measles.
- (2) In that class of skin diseases characterized by the formation of blebs and blisters, and which contain serum, discharging when mature and forming crusts.
- (3) Externally, the fresh inner bark beaten up or simmered and mixed with lard or cream, makes a good ointment in the same class of skin diseases.

*Sambucus* is one of the principal ingredients of the much-advertised remedies for dropsical and rheumatic conditions, anasarca and anadema.

The dose of specific *sambucus* varies from two to ten minims.

## CATCHING COLD

BY HERBERT CORYN, M. R. C. S., ETC., (ENG.).

*Point Loma, Calif.*

A RECENT editorial in the *Journal of Therapeutics and Dietetics* dealt with the subject of catching cold and with the method of avoiding that calamity by the adoption of a particular kind of clothing.

The proper kind of clothing is of course very useful and necessary. But what business has a man to catch cold in *any* sort of clothing?

Catching cold would ordinarily be defined as a specific bacterial invasion, dependent upon a previously existing morbid blood state. I do not know that the bacterium in question has yet been trapped or even searched for; but his existence is pretty sure. Nor has the blood state been exactly determined, though of course there is a smart output of uric acid during the febrile stage. The muscular ache can be removed or diminished by salicylates, bicarbonate of potash, and copious draughts of water: in less degree by quinine and sodium phosphate — all solvents of uric acid. The common cold is therefore doubtless connected with an accumulation of uric acid or its antecedents, and the sudden completion or liberation of this. The discharge into or formation in the blood is either excited by bacteria, or they take advantage of the prevailing conditions. In any case they are, strictly speaking, secondary. It is the pre-explosion stage that the cold taker should consider when he supposes himself quite well.

And so the question stands: What business has a man to accumulate uric acid or its antecedents? If he did not do that, there would be no cold.

Some people accumulate these things anyhow, and should take special measures — quite simple ones, not involving a visit to the drug store and the subsequent swallowing of ——'s famous "uric acid solvent."

Others accumulate them because of bad habits. There is no very sharp line, and many who suppose themselves in the first class would find by a little self-study that they belonged to the second.

Colds are taken in the intestinal canal and in the armchair. In other words their foundations are laid in diet, diet excessive or faulty; and in insufficient muscular exercise. Toxins or their parents accumulate in the muscles; these ought to be habitually squeezed out into the blood stream and washed away.

If colds are taken in those two places, or preparation made there, it would seem to follow that no one need ever take cold. And that I believe to be, in a general way, the fact. And to keep habitually free from the conditions that ultimate in a cold would, I think, be to keep free from the

conditions that lead to most other disease, acute or chronic, and to put off old age to a very far point.

The common cold, when it is an easy and frequent visitor, may be induced to defer or stop its visits by three simple measures, each pretty effective up to a point, but in the lives of most people needing attention collectively.

They are: the taking of more exercise, more water, less and better food. These of course mean the completion of the oxidation of waste products; the squeezing into the blood of those present in the viscera and muscles, intracorporeal washing, and the absence or minimization of intestinal toxins.

The first point may be met by putting every muscle, every morning before eating, in the open air, many times through its maximum of movements till the whole body feels internally fresh and exhilarated, and repeating the same at bedtime. This is of course mainly for the city man who usually takes no exercise whatever, and of the masses whose muscles never get a breath at all. The next point means a pint of water, perhaps warm or hot, after each exercising and during the morning and afternoon.

The third point, for most people, means mainly *Eat Less!* But also, *Eat otherwise.* And if the average cold taker will forget that such a substance as cane sugar exists, and rule it and everything that contains it absolutely out of his diet, he may even need no other measure.

Every doctor knows that the average man regards no meal as complete unless it is nitrogenized by meat or eggs; that he does not consider nuts and fruit as food but merely as agreeable embroidery to meals already sufficient or excessive; and that if he were preached the gospel of less nitrogen, less wheat, no sugar, and more fruits in the meal he would probably prefer his colds. He could with the utmost difficulty be brought to realize that those unnoticed chemico-pathological conditions which from time to time explode in a cold, continuing year after year, not *fully* relieved by any of the colds, must lie at the root of three fourths of the chronic diseases, scleroses or arteries, and what not, of later years — that is, at the root of the disease known as senility. Old age need not mean senility. In death from starvation the brain usually retains its faculties and to a degree its nutrition to the last. Why should it not do the same up to the point of death from old age? The brain cell of old age should be the leaping off place of consciousness to its subsequent stage.

Perhaps I owe my confrères an apology for remarks so trite. But I know that whilst my own colds were once frequent they are now separated by years. And I know that I used frequently to be asked to visit patients for fellow-practitioners unable to do their own work for a day or two because they were "in bed with a bad cold!"

## A STUDY OF THE TWELVE TISSUE REMEDIES

BY JOHN WILLIAM FYFE, M.D., SAUGATUCK, CONN.

## NO. VI. KALI PHOSPHORICUM — POTASSIUM PHOSPHATE

THIS efficient salt is frequently indicated in various wrongs of life, but it is in the abnormal conditions of the nervous system, often referred to as neurasthenic, that the phosphate of potassium has become recognized by many skilled physicians as an indispensable remedial agent. In all nervous states evidencing a want of nerve power, such as prostration, loss of mental vigor, depression, brain-fag, and softening of the brain, it constitutes a medication of curative power.

In all pathological conditions characterized by depression, general irritability, or loss of memory, it exerts an improving influence, and in hysteria from sudden emotion or false impressions, this agent has been employed with beneficial results. In many cases in which stupor, low delirium, sleeplessness, restlessness, or mental aberrations are prominent features, kali phosphoricum is believed to exercise a corrective power. In the condition known as "night-terrors," and in which many children apparently suffer from extreme fright, the phosphate of potassium constitutes a curative agent which should never be neglected.

In referring to the wrongs of the brain and nervous system in which kali phosphoricum has been the means of producing marked improvement, Dr. Carey in part says:

"The gray matter of the brain is controlled entirely by the inorganic cell salt, potassium phosphate. When nervous symptoms arise, due to the fact that the nerve-fluid has been exhausted from any cause, kali phosphoricum is the only true remedy. To my mind this remedy is the most wonderful curative agent ever discovered by man. Let the overworked business man take it and go home good tempered. Let the weary wife, nerves unstrung from attending to sick children or entertaining company, take it and note how quickly the equilibrium will be restored and calm and reason assert her throne."

The phosphate of potassium is employed with marked advantage in vertigo and giddiness resulting from nervous exhaustion and weakness, and in cerebral anemia it is a very efficient remedy. In conditions in which pains and weight in the back of the head, together with a feeling of weariness and exhaustion, are prominent symptoms, this agent will aid much in the treatment.

In various forms of paralysis kali phosphoricum can safely be regarded as one of our most reliable drugs. Dr. W. E. Kinnett has employed the



remedy in many of these cases with wonderful success, and has often found *magnesia phosphorica* indicated in connection with this potassium salt. In reporting a case of paralysis treated with these remedies the doctor says:

"The patient was absolutely helpless so far as doing anything for himself was concerned. His arms and legs were useless to him, and seemed to be in the way. His hands and wrists were out of shape, as were also his legs and feet. He could neither feed nor dress himself. Could move neither hand nor foot and was as helpless as a baby. He could sit propped up, but could not in any manner help himself. He could talk some and eat some when soft foods were put into his mouth. It was certainly an unpromising outlook, and I sincerely wished I had not promised to see him. I felt that he was beyond human aid and told him that it was exceedingly doubtful if I or any one else could help him, but if he would consent to a long period of treatment I would make an effort to help him some, and to this he readily consented; the case of a drowning man catching at a straw.

"I prescribed for him *kali phos.* 3x, five grains every four hours, and *magnesia phos.* 3x, five grains every four hours, alternating with the *kali phos.* The medicines were faithfully administered to him from very early in the morning till very late at night. In about a month he could hold knife and fork or spoon and feed himself, or hold a cup, with the handle, to drink from. In two months he could walk behind a chair, pushing it before him, and could dress himself, buttoning his clothes and tying his shoes. Awkwardly, of course, but he did it. In ten weeks he was walking wherever he chose — slowly and deliberately — and at the end of three months from the first dose of medicine he went to work and could carry a ten-quart pail of water in each hand."

In affections of the ear, especially when there is a discharge of a foul, ichorous, offensive, fetid, or sanious character, the phosphate of potassium exerts a corrective influence. Offensive discharges from any part constitute an important specific indication for this drug. In the epistaxis which frequently occurs in the weak and delicate person the action of this agent is decidedly restraining in its nature, and in stomatitis, when the breath is offensive, as well as when there are ash-gray ulcers in the mouth, it is often a most useful remedy. In diseases of the throat characterized by large and sore tonsils, with white, solid deposits resembling diphtheritic membrane, hoarseness, and loss of voice, *kali phosphoricum* is a remedy of unmistakable efficiency, and in indigestion with nervous depression it has been employed with satisfactory results. It is also a remedy of value in diarrhoea which is painless and causes great prostration, especially when the discharges are bloody, fetid, and much like rice water.

In amenorrhoea with depression, lassitude, and general nervous debility, accompanied by pain in the ovaries, the phosphate of potassium is deemed a medicament of considerable value, and when the menses are

premature and profuse, especially in nervous subjects, it is often a much needed remedy. It is also employed with advantage in dysmenorrhoea, and Dr. Whittier reports a case of several years' standing which was completely cured by him with this drug after many approved remedies had failed to benefit the patient. In leucorrhoea, when the discharge is yellowish, acrid, and scalding, its action is corrective, and in incontinence of urine it is a useful agent.

In abscesses, carbuncles, and other suppurative processes, when there are asthenic symptoms and the suppurative action is unhealthy, the pus ichorous, bloody, offensive, and dirty, kali phos. exerts an improving influence, and in marasmus, especially when the stools have a putrid odor, it has been used with beneficial results.

In large and frequently repeated doses, the phosphate of potassium has been employed as a means of relieving the difficult breathing and depressed condition of the nervous system in nervous asthma and with satisfactory results. Hay asthma and hay fever are also said to be modified by the administration of this drug.

In diabetes mellitus, kali phos. may well constitute a part of the treatment, as it exercises an influence which makes for normal function of the medulla oblongata and pneumogastric nerve, thus favoring digestion and normal activity of the stomach and lungs.

As a part of the treatment of the morphine habit the phosphate of potassium has been employed with more or less success. In reporting the case of a lady who had become a morphine fiend, Dr. B. A. Sanders in part says:

"I had used everything I could find in any school of medicine without benefit to my patient, and felt thoroughly discouraged, when I happened to think of kali phos. I started her taking it, and at the same time stopped all other nerve medicine. The change was wonderful. The sharp, intense headache, sleeplessness, wild, staring eyes, brown, dry tongue, and that horrible sinking, 'all-gone' sensation rapidly yielded to the remedy, and she made a good recovery. She is now — four years later — a remarkably vigorous, healthy, and happy woman, without the least desire for the opiate, and has, as she expressed it, a 'perfect terror of morphine.' I ascribe all the cure to kali phos., for the other treatment could not have been completed had it not been for this salt."

In puerperal fever, especially when there are illusions and absurd notions, or a tendency to violent insanity, this constitutes a very useful medicine. In septic hemorrhage it has also been employed with advantage. In fact, it is a remedy of merit in all cases in which there is evidence of vitiation of the blood, and in which the system seems to contain typhoid poison.

In intermittent action of the heart, with morbid nervous sensitiveness, this agent has been administered with marked benefit.

The phosphate of potassium should be more carefully studied from the viewpoint of specific medication, as it undoubtedly possesses properties of great value. The following indications, taken from Fyfe's *Materia Medica* (the only Eclectic work that gives a symptomatology of the tissue salts) will suggest the lines along which this remedy is most likely to be found useful:

"Despondency and nervous dread, without cause; brain-fag from overwork; delirium tremens; vertigo and giddiness from nervous exhaustion and weakness; pain and weight in the back of the head, with feeling of exhaustion; discharge of foul, offensive pus from the ears; loss of power in facial muscles: tongue white and slimy; edges of tongue red and sore; predisposition to bleeding of the gums; tonsils large and sore, with solid deposits on them; hoarseness and loss of voice; flatulence, with distress about the heart; diarrhoea, when the stools are putrid, or like rice-water; putrid and typhoid dysentery, parietic condition of rectum and colon; menses premature and profuse in nervous females; menses irregular, scanty, offensive, and very dark; hysteria, with sensation of a ball rising in the throat; parietic conditions of the bladder, and incontinence of urine from paralysis of the sphincter of the bladder; yellow urine; functional wrongs of the heart, accompanied by a weak, nervous, and anxious state, and when the pulse is intermittent, irregular, and below normal; palpitation of the heart, with sleeplessness and restlessness; infantile paralysis, walking in sleep in children; fetid, debilitating, profuse perspiration; typhoid conditions, especially when the tongue is brown and dry and there is delirium; putrid conditions of the throat, especially in scarlet fever; general debility and exhaustion; dirty, foul, ichorous discharges of pus."

The dose of the third trituration of the phosphate of potassium is from five to fifteen grains, but its best effects are usually obtained by prescribing it as follows:  $\mathcal{R}$  Kali phos., 3x, gr. xx to  $\mathfrak{J}$ l; water,  $\mathfrak{J}$ iv. Teaspoonful every hour or two.

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We must learn to live,  
Care-hardened at all points; not fere and sensitive,  
But plated for defence, nay, furnished for attack,  
With spikes at the due place, that neither front nor back  
May suffer at that squeeze with Nature we find — life.  
Are we not here to learn the good of peace through strife,  
Of love through hate, and reach knowledge through ignorance?

— Robert Browning

## PHYSICAL THERAPY

### FIRST STEPS IN MEDICAL ELECTRICITY

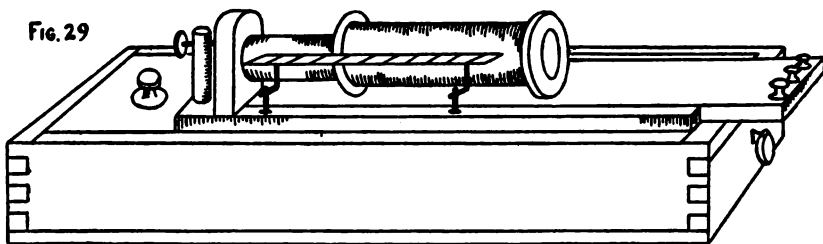
BY HERBERT McINTOSH, A.M., M.D., BOSTON, MASS.

#### CHAPTER V

##### PHYSIOLOGY OF COIL CURRENTS

WE are now to endeavor to ascertain the effects which coil currents exercise upon living tissues. For this purpose it is well to employ a coil which enables us to note with some accuracy the intensity and quantity of currents delivered. A coil in which variations in the intensity of the current are indicated on a scale corresponding to the position of the secondary coil with reference to the primary, possesses advantages over one in which intensity is varied by the movement of a hollow cylinder over the core. Such an arrangement is called a "sledge," or sliding coil (Fig. 29) because

Fig. 29



the secondary is movable with reference to the primary coil. If now we undertake to study the properties of currents delivered from the secondary winding of such a coil, by inserting needles attached to the positive and negative poles into a piece of beef muscle, and pursue the same order as was followed in the preceding study of the direct current we shall find:

(1) *That there is no marked difference in the reaction of fluids surrounding the poles.* If the poles of the secondary winding be placed in a mixture of iodide of potassium and starch, the blue color caused by the action of the dissociated iodine upon the starch may appear at both poles.

(2) *That there is no collection of gas at either pole.* When platinum terminals, connected with the secondary poles of an induction coil, are immersed in water, a momentary electrolysis takes place. The dissociated oxygen produces an oxide of platinum which is then reduced to metallic platinum by combination with the nascent hydrogen. This process takes place at both poles, so that both become covered with powdered platinum. As platinum has the power of occluding oxygen, it is probable that the gray

appearance of the poles is due to the conversion of the metal into its spongy form.

(3) *That there is no chemical or noticeable chemical effect exerted upon the surrounding tissues.*

(4) Employing the apparatus used in Chapter IV — “Physiology of the Direct Current.” (Fig. 26) — we discover that there is no physical transfer of fluids between the poles.

Employing the apparatus used in Chapter II (Fig. 9), Physics of Coil Currents, we discover that there is no permanent separation of water into its constituent elements and therefore no permanent electrolysis. Therefore, as both the elements of physical transfer and electrolysis of fluids are lacking, *there is no cataphoresis, and consequently no noticeable desiccating or dehydrating effect at either pole.*

(5) Experiments may be made tending to show that coil currents exert no appreciable effect upon the growth of cultures. *Therefore, coil currents are without bactericidal effect.*

While there has been a general agreement upon this proposition, Spilker and Gottstein have reported experiments in which strong and long-continued induced currents, even where heating effects were guarded against, produced a destructive effect upon the growth of cultures.

The above experiments may be thus summarized:

Coil currents exert no considerable chemical effect upon animal tissues, and so far as they are manifest at all are, for therapeutic purposes, quite negligible. Admitting that induction currents from a large Ruhmkorff coil may produce chemical effects, yet these currents are of such volume and intensity as to preclude their use for therapeutic purposes. In coils whose currents are suitable for direct application to the human body, the swift change of polarity tends to destroy chemical action. This lack of continuity, in which relatively long intervals occur between the crest of successive waves, during which no currents or currents of slight intensity and quantity are flowing, still further reduces chemical action.

In this discussion we are confining ourselves to the effect of the induced current. The primary current is a battery current interrupted by the vibrations of a spring, and is a unidirectional current, modified by the phenomena of extra currents. Such a current readily electrolyzes iodide of potassium, producing a brown cloud at the positive pole, or a blue color if the iodide of potassium has been first mixed with starch. The induced current is not unidirectional. It is made up of a current at the make and a current opposite in direction at the break of the circuit. When used for therapeutic purposes, induction coils deliver currents of high intensity, but small volume. As chemical action is dependent upon amperage rather than voltage we have an additional explanation for the slight chemical effect of induction currents.

We must, then, look for the physiological effects of coil currents in a different direction. If we take into each hand a metal electrode attached to a coil, we detect the presence of a current. This may be called "stinging," "numbing," "burning," or under certain conditions perhaps "soothing."



If one pole of an induction coil be placed immediately in front of the ear and another near the corner of the mouth on the same side of the face, it will be noted that the mouth is drawn to one side and the eye is closed (Fig. 30). This is evidently due to the stimulating effect of the induced current upon the facial nerve and the muscles which it innervates, or directly upon the muscles themselves.

These experiments are sufficient to show that while coil currents do not produce appreciable chemical effects, they excite marked sensory and motor effects. Such other effects, as may be produced by these currents, as for instance, improved metabolism, increased activity in glandular

processes, and larger eliminations of toxic products, are probably due to the excitation and passive exercise of nerve and muscular tissues.

While we are obliged to deny a marked chemical polarity to coil currents, used for therapeutic purposes, inasmuch as an alternating current quickly neutralizes the tendency toward chemical action, yet there is a sensible difference between the positive and the negative pole. The negative pole is more irritating to the sensory nerves than the positive pole. This is due to the more abrupt rise of the curve when the current is broken. So marked is the difference between the effect produced at the positive and the negative pole that, *physiologically*, induction currents may be regarded as unidirectional, owing to the preponderating influence of the negative pole.

*Physiological measurements of coil currents.* In Chapter III, on the physics of coil currents, a brief reference was made to instruments invented for the purpose of measuring coil currents. These are designed to measure

the electromotive force of the currents delivered from induction coils and are successful in accomplishing this end, but unfortunately the results thus obtained in the testing of different coils do not correspond with the physiological responses of living tissue. These instruments, therefore, are for medical purposes of little value.

Moreover, the electromotive force of induction coils varies with the amount of resistance interposed between the terminals.

Such measurements, therefore, do not assist us much in determining the effects of coil currents, because the relation between electromotive force and physiological effect is evidently complicated by other factors, as, for instance, rapidity of interruptions of the current, presence or absence of the core, position of the secondary coil with reference to the primary, relation of diameters and lengths of wires in primary and secondary coils, and finally strength of the battery exciting the primary coil.

*Curves of Coil Currents.* That each one of these factors has an influence in determining the physiological effect of coil currents is not a matter of conjecture, but can readily be proved by a study of the curves produced by the same instrument under the different conditions named above, and these different curves are found to correspond to differences of physiological effect.

These curves are obtained from the tracings of an oscillograph on a moving photograph plate and vary widely from one another, according as one or more of the factors above mentioned are altered or eliminated. One or two illustrations will serve to explain the effect of a variation in one or more of the factors determining the physiological effect of coil currents.

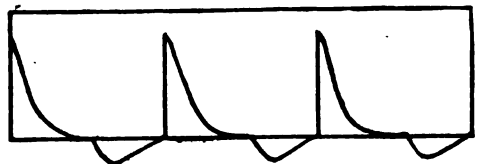
Fig. 31 represents a tracing of a curve of a coil in which one third of the secondary winding is used. The waves above the line represent the current at break, those below the current at make, and the interval between represents the time between discharges. The tracing is read from left to right.

Fig. 32 represents the current curve of the same coil when the whole secondary winding is employed. The use of the oscillograph method of

FIG. 31.



FIG. 32



comparison of curves has shown that a coil giving about one hundred interruptions per second with individual waves lasting one one-thousandth

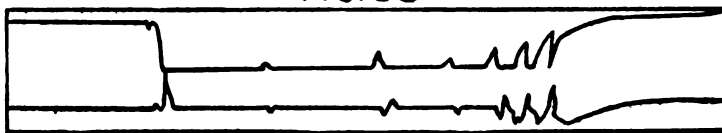
of a second and intervals nine times as long is best suited for muscular stimulations.

*Sensory Effects.* By using the same method for studying the curves of induction coils, the interesting discovery has been made that the painful effects of coil currents are proportional to the length of their curves. Thus a wave that lasts one two-hundredths of a second is excessively painful, while one that lasts one four-hundredths of a second is not unpleasant.

Now it is found experimentally that the production of long waves accompanies a high degree of self-induction, to which reference has been made in Chapter III, "On the Physics of Coil Currents," under the sub-head of *Extra Currents*. These currents are found to be greater in coils where there is a great length of wire in the primary and secondary coils, much iron in the cores, and the current is interrupted by an auxiliary electro-magnet.

*Motor Effects.* While the effect upon sensation is influenced by the length of the wave, the contraction of voluntary muscles is not thus modified.

FIG. 33



*Mechanical Interrupters.* (Fig. 33.) A study of the above tracing makes it evident that the interrupter has not always succeeded in making contact. The failure to make sharp, clean interruptions is indicated by slight elevations and depressions to the left of the waves. This evident imperfection in interruption of the current, which, owing to the irregularity in wave lengths thus produced may occasion disagreeable sensory effects, has led to the use of mechanical interrupters which possess many advantages over the ordinary vibrating hammer. These advantages are:

- (1) Both the quality and the intensity of the current can be measured.
- (2) The frequency of interruption can readily be determined and, finally,
- (3) The stinging effect upon the sensory nerves can be avoided by producing impulses of short duration.

*Anæsthetic Effects of Coil Currents.* If the terminals of a secondary coil producing one hundred or more interruptions per second and having a proper relation between its wave length and interval of rest as described above, be applied to the trunk of a nerve, having a cutaneous distribution, a sense of numbness will soon appear in that area in addition to the effect felt at the point of application of the electrode. This is a true anæsthesia, both tactile and painful sensations being partially obliterated. When the



current is cut off, a glow accompanied with perspiration frequently follows. This is in all probability a purely mechanical effect. A similar effect is obtained from the positive pole of the direct current, due, however, largely to its chemical action.

*Counterirritation of Coil Currents.* If a wire brush electrode attached to one of the terminals of the secondary winding of an induction coil is applied to the skin, after a time it will be found to be reddened, somewhat as it appears after an application of mustard or mustard water. This is a familiar effect of coil currents.

*Summary and Comparison of Direct and Coil Currents.* We are now in a position to summarize the effects produced by coil currents as being:

(1) Sensory, which are usually painful, but under some conditions sedative. (2) Motor. (3) Counterirritant.

It is true that sensory, motor, and counterirritant effects are not confined to the induced current, but are manifested also by the direct current; but with the latter sensory effects occur not only at the opening and closing of the current, but also during its passage. These effects are due to the chemical action of the direct current and are felt chiefly at the negative pole. The motor effects of the direct current are due principally to interruptions, while counterirritation results from chemical action.

It is thus very apparent that the range of effects produced by coil currents is much smaller than that produced by direct currents; for the interrupted direct current, that is, the so-called voltaic alternative, is capable of taking the place of coil currents to a very great extent; and at the same time lends itself readily to careful measurement.

The problem of measurement of coil currents is, indeed, up to the present moment quite insuperable; not because the physical problem is so difficult, but because physiological responses to coil currents do not bear a proportional relation to the variations. It might therefore well become a question, whether, in the interest of scientific accuracy, it would not be better to use the interrupted galvanic current, or at least an induction current, in which the interruptions, instead of depending upon the uncertainties of a vibrating hammer, are produced by a mechanical interrupter entirely independent of the current produced by the coil. Against this suggestion may be urged the cheapness and portability of induction coils as ordinarily constructed, which have been, in effect, as contrasted with the galvanic battery, their chief recommendation to popular favor.

Moreover, while a coil current will produce contractions only in muscles which are in healthy relation to the motor nerve governing them, a direct current will produce contractions even when the nerve is cut, and will continue to do so even after there has been extensive degeneration in muscular tissue. Consequently, where there is atrophic spinal or peripheral paralysis the direct current should be employed.

*(To be continued.)*

# DEPARTMENT OF DIETETICS

## THE DIETETICS OF SUGAR

BY J. A. DENKINGER, M.D., BOSTON, MASS.

*Continued from Page 321*

### COMMERCIAL GLUCOSE

COMMERCIAL glucose, also known as corn syrup or glucose syrup, is manufactured on a large scale from cornstarch or potato starch by boiling with dilute acids and contains more or less unconverted dextrin from the incomplete hydrolysis of starch. Glucose can be made from cellulose; it is even possible to make it from sawdust or old cotton rags, but it is not now and probably never will be a profitable process (Thorpe). Commercial glucose has a relatively low saccharine value, and, like dextrose, it readily undergoes fermentation.

There has been much discussion as to the healthfulness of commercial glucose as compared with canesugar and the natural sugars. In 1882 the National Academy of Sciences appointed a committee at the request of the United States Commissioner of Internal Revenue to investigate the subject, which reported (1884) that glucose is in no way inferior to canesugar in healthfulness and that it has no deleterious effect upon the system even when taken in large quantities. More recently Dr. Wiley has gone on record in referring to glucose and grapesugar, *when properly made* [italics mine], as valuable food materials and not injurious.

Dr. Henry Rushby, in his article on "Glucose," in the Reference Handbook of Medical Sciences, goes so far as to say: "Undoubtedly the human race would be far better off, so far as health is concerned, if the use of *pure glucose* [italics again mine] could be generally substituted for that of canesugar." It will be noticed that Dr. Wiley speaks of glucose *when properly made*, and Dr. Rushby of *pure glucose*.

Quite recently, Professor Leffmann, of Philadelphia, in an article in the Journal of the American Medical Association (January 26th and March 2, 1907), critically reviews the report of the committee of the National Academy of Sciences, and throws some doubt as to the harmlessness of commercial starch sugar (glucose and grapesugar), especially when made with sulphuric acid. It would certainly seem that the commercial glucose is by no means equally as healthful as the normal digestion products of starch.

## INVERT SUGAR

Invert sugar is, as we have already seen, a mixture of about equal parts of dextrose and levulose, and is produced from canesugar and some of its isomers by simple boiling, by boiling it with weak acids, as well as the action of ferments. The syrup formed by boiling a mixture of canesugar and fruit juices is a familiar example of manufactured invert sugar. Invert sugar does not crystalize, and is somewhat sweeter and much more digestible than canesugar.

## HONEY

Honey is the most familiar form of natural invert sugar and contains about forty per cent dextrose and thirty-five per cent levulose and more or less canesugar. The honey from bees, drawing only on natural raw material for honey-making, contains only a small quantity of canesugar, running from a trace to ten per cent.

The honey of bees fed exclusively on canesugar consists largely of invert sugar, the change being brought about in the laboratory of the body of the bee, but a certain amount of the canesugar escapes inversion, as much as thirty per cent of the unchanged canesugar having been found. In addition to the practice of feeding bees canesugar to produce honey, which is hardly a commendable process, honey is also freely adulterated with canesugar syrup, invert sugar, glucose, etc. Honey has been used from the earliest times and was, until comparatively recent times, the only sweetener used.

From determination of the amount of saccharose matter in different flowers it has been calculated that to make a kilogram (a little over two pounds and three ounces) of honey, the bees must visit from two hundred thousand to five hundred thousand flowers (Blyth).— Busy little bees.

Honey has laxative properties and has been used more or less successfully in habitual constipation. The sugar or rather sugars of honey are the most assimilable sugars known, making pure honey one of the most easily digested as well as most palatable saccharine substances known.

## GALACTOSE

Galactose is the sugar formed with dextrose in the inversion of lactose. It is less sweet than canesugar, is fermentable with yeast, but less easily than dextrose.

## LEVULOSE

*(Fructose, fruit sugar, sacro-levulose, levo-glucose, mucoid sugar)*

Levulose is isomeric with dextrose and occurs together with dextrose

and more or less saccharose in honey and many sweet fruits. It is also found with dextrose in the inversion of canesugar. It is sweeter than dextrose and ferments with yeast, but less readily than dextrose. It is a wholesome and easily assimilated form of sugar. One of the objections to levulose is its high price (\$1.80 per pound).

Levulose has proven to be one of the most assimilable sugars in diabetes, and I shall have more to say in reference to levulose when we come to a consideration of "Sugar in diabetes."

#### THE ASSIMILATION OF SUGAR

The carbohydrates are more completely assimilated than any of the other nutritive constituents of the food.

According to all recent investigators, the carbohydrates of our food are all assimilated in the form of dextrose, levulose, and galactose. In the language of Chittenden, "Practically all carbohydrate food is converted into a monosaccharide, principally dextrose, in the alimentary tract, and it is in this form of simple sugar that the carbohydrates pass into the blood."

These sugars are absorbed directly into the portal capillaries and carried by the portal vein to the liver where they are converted into and stored as glycogen. According to Chittenden, "Glycogen may be looked upon as a temporary reserve supply of carbohydrates, manufactured and stored in the liver during digestion," ready to be drawn upon and to be reconverted into dextrose and fed to the blood and other tissues as required. The muscles (and to a less extent, some of the other organs of the body) are also reserve stores of glycogen which becomes available for the production of muscular power. The sugar entering the bloodstream and other tissues is utilized in the liberation of energy and force and the production of heat, and the waste is eliminated chiefly by the lungs, as carbonic acid gas and water. When a greater amount of sugar is absorbed than can be stored in the liver and in the muscles, or utilized by the blood it is converted into fat and deposited in the connective tissues.

According to modern authorities, maltose is not, as used to be taught, absorbed as such. Says Chittenden, "Maltose like canesugar is a disaccharide and the body has no power to burn and utilize it directly, but in the intestine and elsewhere is an enzyme (maltase) which breaks maltose into two molecules of the monosaccharide dextrose, and this the body can use. There is no apparent reason why maltose should not be absorbed and assimilated as readily as dextrose, but so urgent is the necessity for this conversion into dextrose, that in the blood itself there is present maltase (Röhrmann and Bial) to effect the transformation of any maltose that may gain entrance there. We are here face to face with a simple fat in nutrition. The body cannot utilize disaccharides directly."

## SUGAR ABSORPTION FROM THE STOMACH

Although the stomach is not well adapted for the absorption of food, it was taught for a long time that the stomach easily absorbs such substances as water, salts, sugars, and peptones. The experiments made by Von Mering seemed to prove that not only dextrose, but maltose, lactose, saccharose, as well as dextrin were absorbed from the stomach. "Actual experience, however, made under conditions as normal as possible, show upon the whole that absorption does not take place readily in the stomach, certainly nothing like as easily as in the intestines, and that there is reason to believe that but little sugar is absorbed from the stomach." (Howell's *Physiology*, 2d edition, 1907).

## THE ASSIMILATION LIMIT OF SUGAR

This term refers to the maximum quantity of sugar that can be ingested at one time without causing the appearance of sugar in the urine. If a large quantity of sugar is absorbed in the course of a short time, the glycogen-forming power of the liver is unable to keep pace with the demands made upon it, with the result that some of the sugar will appear in the urine (alimentary glycosuria). This limit varies with different sugars. Of the sugars in ordinary use the assimilation limit for twenty-four hours on a fasting stomach is approximately as follows:

It is highest for dextrose, about two hundred, two hundred and fifty grams, somewhat less for levulose, and still less for galactose, for canesugar and maltose\* it is about one hundred and fifty to two hundred grams, for lactose it is only one hundred and twenty grams, and has been found in the urine after giving as low as fifty grams (Worm-Müller, quoted by Von Noorden). This would indicate that milk sugar will produce alimentary glycosuria more quickly than other sugars. There are, of course, marked individual differences as to the readiness with which alimentary glycosuria is produced by different sugars. Linossier and Rocque found sugar in the urine of some persons after taking only fifty grams of sugar, in others only *after* three hundred and fifty grams. There is, however, no question that when larger quantities of sugar are ingested (at one time or within a short time) than the assimilating organs can utilize, the excess is eliminated by way of the urine.

The reason for the low assimilation limit of the disaccharides as given by Fischer is, "that when they are fed rapidly and in large amounts, they pass without change into the blood, and since the liver and muscles retain the disaccharides but imperfectly, their concentration in the blood soon exceeds the limits at which the sugar passes over into the urine." If cane-

\*In the metabolism experiments with infants, Keller, as quoted by Von Noorden, found the assimilation limit higher for maltose than any other sugar.

sugar, maltose or lactose are fed slowly they are all converted into monosaccharides before they are absorbed; but if fed *too rapidly* they are not split before they are absorbed and may be recovered as such from the blood and from the urine. It has been claimed that persons with a low assimilation limit are potential diabetics, *i.e.*, they are more liable than others to become the victims of diabetes. I do not think that there is a sound foundation for this any more than for the charge that large sugar eaters are more liable to become diabetic. Our Southern negroes and the negroes of the West Indies, who are large sugar eaters, canesugar or sugarcane at that, as well as a number of Asiatic races, including the Japanese, who are large consumers of both starch and sugar, are remarkably free from diabetes. The assimilation limit for starch is much higher than for sugar (according to some authorities over five hundred grams for twenty-four hours) hence very large quantities of starch can be ingested without causing the appearance of dextrose in the urine. This is readily explained by the fact that absorption and assimilation are able to keep up with the relatively slow saccharification taking place in the process of starch digestion.

#### CARBOHYDRATE FERMENTATION AND ITS RESULTS

Not all of the carbohydrate material ingested is changed into dextrose or its isomers and absorbed as such to aid in maintaining nutrition. A certain amount undergoes fermentation. This of itself presents nothing abnormal and goes on in health as well as in disease. It is only when the process of fermentation becomes excessive and gives rise to more or less serious gastrointestinal symptoms or results in serious loss of "nutritive potential" (Herter) that harm results.

Of the three principal food stuffs — fats, proteids, and carbohydrates, the latter are most liable to fermentation for which reason the ingestion of carbohydrates, especially sugar, should be restricted whenever there is excessive fermentation of the gastric or intestinal contents.

There are four well-recognized forms of fermentation, *viz.*: first, alcoholic fermentation, resulting in the formation of alcohol; second, acetic fermentation with the formation of acetic acid; third, lactic fermentation, the product being chiefly lactic acid, and fourth, butyric fermentation, with formation of butyric acid. Frequently two or more forms co-exist. Although all sugars are fermentable sugars, *i.e.*, they all undergo some form of fermentation, direct or indirect, it has been found that sugars differ in the readiness with which they undergo the different forms of fermentation mentioned. Some interesting experiments have been made by Robertson and others on this subject, but the results obtained are as yet not conclusive. There is general agreement, however, that lactose resists fermentation (excepting lactic acid fermentation) longer than other forms of sugar.

Gastric and intestinal fermentation, especially when abnormal, results in the production of various irritating acids, such as butyric, lactic, and acetic acids and the liberation of gases (carbon dioxide and hydrogen gas, but chiefly the former) which in turn results in distension of the stomach and bowels, followed by eructations and frequently very acid, diarrheal stools.

According to Herter, "Fermentative decompositions are much more likely to induce flatulence when sugar is used than when starchy carbohydrates are employed," and Fischer remarks that alimentary fermentations are more numerous after the ingestion of excessive amounts of disaccharides than after the use of equally large amounts of starch, for which reason Moritz recommends restriction or exclusion of sugar in every case of gastric fermentation, substituting starchy food for the sugar.

#### SUGAR AND DIARRHEA

Herter considers carbohydrates the most frequent cause of diarrhea *from food*. The connection between the excessive ingestion of sugar and diarrhea are quite clear. Concentrated solutions of sugar are known to be very irritating to the mucous membrane of the stomach and bowels. We also know that sugar tends to limit the absorption of water from the bowels (Ortner), and in this way brings about a liquid or at least a pultaceous stool. The irritating organic acids, formed as the result of fermentation, induce, even in small quantities, an increased secretion of water, and, with the gases (carbon dioxide and marsh gas) formed at the same time, they stimulate peristalsis powerfully and give rise to diarrheal evacuations, acid in reaction and odor. In addition to the troublesome symptoms enumerated, it should not be forgotten that the sugar undergoing excessive fermentation and giving rise to diarrhea is unavailable for nutrition. As Jacobi remarks: "Where there is purgative action there can be no nutritive effect." This loss of "nutritive potential" may prove rather troublesome if long continued, unless the loss of calories from carbohydrate fermentation is made up from the fats and proteids. Should these two undergo decomposition or putrefaction, or otherwise be more or less unavailable for nutrition, which is by no means uncommon, there would be serious difficulty in meeting the caloric requirements of the body with consequent loss of weight and strength.

*(To be continued)*

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Life means learning to abhor  
The false and love the true.

— *Robert Browning*

## DIGESTION \*

BY DAVIS P. BORDEN, M.D., PATERSON, N. J.

IN this day of fashionable and unphysiological living, digestion is one of the most important subjects that can engage the attention of the physiologist and pathologist; and its importance should commend it to the earnest consideration, not only of thinking persons, but of the whole people.

It is, perhaps, well enough known that the proper maintenance and preservation of life depend upon the proper supply of aliments; and that these undergo a series of changes in the digestive apparatus by which they are separated, part being resolved into fecal matter, to be expelled, and part to be blended and incorporated into the nutritive fluids. The end of digestion is the preservation of the integrity of the organism, by restoring to it the elements of proximate principles, which it is deprived of by the processes known as retrograde metamorphosis.

Alimentary substances may be arranged under three heads: 1, The neutral, as albumen and caseine. 2, fatty matters; 3, gum, starch, and sugar, the ingredients of which may be represented by water and carbon. Experiments have shown that the two latter classes are insufficient for the alimentation of an animal, and hence it is necessary to include the first. It is well known that albumen, fibrine, and caseine are substantially alike in their chemical constituent, and seem to differ principally in regard to the minute quantities of phosphorous and sulphur which they contain. Vegetable albumen and animal albumen appear to be identical. In corn flour there exists a substance similar to caseine, and in gluten another bearing resemblance to animal fibrine. It would not seem, then, that there was any essential difference between the aliments of herbivorous and carnivorous animals, except that the former feed upon plants and the latter upon other animals. Since the composition of the blood as well as that of the principal animal and vegetable tissues is similar to that of the actual organic substances which become part of the animal organisms without material change of constituents, the change being only in form, it is natural to infer that in the act of digestion the neutral alimentary bodies simply enter the blood in a state of solution without undergoing any other change.

The gastric juice itself contains lactic acid holding pepsin in solution. The acidity of the gastric fluid is influenced more or less by the quality of the aliments; while fasting, it is less marked; but it increases by contact with food, and is strongest when that is constituted of fibrine, albumen, etc. The pepsin acts as a body endowed with catalytic properties when dissolving these substances and their solution is effected by contact. It is only in the

\*Read at Massachusetts Eclectic Medical Society Meeting, June, 1908.



stomach, or by the medium of certain glands in its mucous membranes, that the acid solution of pepsin or the gastric juice is separated. The neutral substances dissolved in the stomach by the acid, or the action of the pepsin, enter the blood through the walls of the capillary vessels of the stomach.

Alcohol introduced into the stomach is also absorbed as well as water. Neither of them passes beyond this viscus, or is found in the chyle, and yet both make their way into the blood. Hence the digestion of neutral substances consists simply in their dissolving, which takes place principally in the stomach. The mastication of substances mixed with a slightly alkaline and tepid liquid, resembling the physical operation, which is carried on in the laboratories, in reducing a body to powder in order to facilitate its solution. The gastric juice which the stomach always secretes at the time of digestion is substantially an infusion of pepsin in acidulated water; and where it acts upon coagulated albumen, fibrine, or caseine, the solution of these substances takes place in the stomach, as in any other receptacle suitably warmed. The influence of a section of the nerves of the eighth pair, in disorders of digestion, may be partly attributed to the cessation of these movements of the stomach which are directly controlled by these nerves. A small quantity of pancreatic juice added to a certain quantity of cooked flour or starch at a given temperature quickly dissolves it, and ultimately all traces of starch will disappear. The same result is produced if we select, instead of the pancreatic juice, some part of the pancreas of a fowl, or some other animal. The starch is dissolved and converted into dextrine or sugar. Hence it is reasonable to conclude that the same organ is endowed with the function of dissolving starch, as well as neutral substances, only that in order to act upon the former an alkali is necessary, and in the case of the latter, an acid. It may still be a question whether the starch thus converted into sugar by the saliva and pancreatic juice passes into the blood in this form, or whether it is not first changed into lactic acid; for it is only in the blood of certain diabetic persons that sugar has been found. The supposition that the starch is converted into dextrine, then into sugar, and finally into lactic acid, which is absorbed and carried into the circulation, appears most plausible.

We should not forget the important fact in this connection, the property which certain of these animals acquire from a contact with water for a certain time of converting large quantities of sugar into lactic acid. These substances which in certain conditions incite the lactic fermentation, assume another form, which is evidently a more advanced state of transformation. The nature of this, I believe, is yet unknown. It is not attended with the production of more lactic acid from their action upon sugar. On the contrary, they assist in promoting the alcoholic fermentation, by converting sugar into carbonic acid and alcohol; for it is well known that a solution of sugar injected into the veins of an animal quickly becomes apparent in the

urine. One experimenter has promulgated the opinion that in the case of diabetic patients the starch is converted into sugar in the intestines, and passes into the blood and urine in this form. Another has proclaimed to the world that the quantity of sugar in the urine of a diabetic patient bears no relation to the quantity of starch in the diet, and that under the use of a strictly azotised diet as much sugar is formed as under one from which amylaceous substances have not been excluded. It is more than probable that this author found sugar in the contents of the intestines of diabetic patients, as also in the matters vomited by them, but only after a meal composed of such substances. But I think this is not peculiar to diabetic persons. There is as much sugar found in the body of a healthy individual under these circumstances as in the person suffering from this malady.

This fact of the transformation of starch into sugar is of great importance in connection with the theory of digestion. From experiments recently made it is evident that large quantities of fatty matters are consumed by carnivorous animals; and are carried to the adipose tissues without undergoing any change in their composition. From these and various other facts of the nature and function of the digestive apparatus, it follows that fatty substances do not undergo any change in the stomach, and that they are carried into the intestine simply liquefied or nearly so by the heat of that organ and of the viscera. The alkali of the bile and pancreatic juice neutralizes the acid of the gastric juice, which affords a new proof that its dissolving action upon azotised substances ceases in the intestine. It has thus far been extremely difficult even by the analogies and chemical facts, to decide what becomes of fatty substances after they leave the stomach. It is quite certain, however, that they are absorbed and that the lacteals are almost the sole agents endowed with this function.

One other fact I will mention, bearing on the point under consideration. A quantity of atmospheric air is introduced into the stomach along with the food. Its oxygen evidently disappears in the stomach, probably by passing through the membranes till it reaches the blood, or by taking part in the transformation of albuminous substances into ferment. Carbonic acid appears to be produced in great abundance, and observation shows that large volumes of this gas are disengaged, especially by some ruminants which feed upon fresh succulent herbs. It is wonderful to observe that the production and disappearing of this large quantity of gas in the stomach and intestines take place and succeed each other with such extraordinary rapidity that we may have recourse to chemical action to account for them. The presence of hydrogen has not hitherto been accounted for by any of the chemical changes which are known to take place in digestion.

The inorganic substances which are found in the organism are probably introduced there, and form part of the food; they can only reach the blood by being dissolved in water and the gastric juices of the stomach. Every-

thing which is not reduced in this way is necessarily rejected with the excrements. Intelligent physicians, especially those of the Reformed School, do not forget this in selecting and preparing medicines.

Careful observation and experience prove that there is no occasion to wonder that large doses of inorganic salts produce no effect when introduced into the stomach. They are rejected as excrementitious.

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### DIET IN CONVALESCENCE FROM TYPHOID\*

As the fever subsides it becomes an important question how soon to allow a return to solid food. Relapses are very easily induced by indiscretion in this regard.

The patient's appetite is always a dangerous guide to follow in this disease. After four or five weeks of an exclusive milk or milk and broth diet, when the temperature subsides, and often before it has become normal, he becomes ravenous. Like a long-starved man, he thinks of nothing but food, and demands something new to eat every day. A hospital ward containing a dozen convalescing typhoid-fever patients is difficult to manage, as a bread riot is constantly menaced. Ill-advised but sympathetic friends attempt to smuggle in all manner of forbidden fruits, and the patient just arrived at the hungry state is tempted to steal solid food from his more advanced neighbors.

In the milder cases it is undoubtedly both safe and wise to allow a strengthening diet at an early date, and it will greatly prolong convalescence to forbid it. Light farinaceous diet — tapioca, rice, vermicelli, cream-toast, a cracker soaked in cream, etc., — may be given with impunity in cases which have run a mild course as soon as the temperature remains normal. Meat-broth may be thickened with rice, sago, or vermicelli. In a day or two more, the soft part of oysters or a chop are permissible in cases which have presented no need of prolonging a fluid diet for fear of intestinal injury.

The following is a list of fluids suitable for the different days of convalescence, commencing a day or two after disappearance of all fever. Milk should still be given, until gradually wholly replaced by solid food.

*First Day.*— Chicken broth thickened with thoroughly boiled rice. Milk toast or cream toast once only during the day. Beef juice.

*Second day.*— Junket, mutton broth, and bread crumbs. Cocoa. Milk toast. A piece of tender steak may be chewed but not swallowed. One of the prepared farinaceous foods, such as Mellin's or Horlick's, may be given with a cup of hot milk.

*Third Day.*— A small scraped beef sandwich at noon. A soft cooked

\* Practical Dietetics, A. F. Pattee, New York City.

egg or baked custard for supper. Boiled rice or potato puree strained. Arrowroot gruel.

*Fourth Day.*— The soft part of three or four oysters. Meat broth thickened with a beaten egg. Cream toast. Rice pudding or blancmange and whipped cream, or Bavarian cream.

*Fifth Day.*— Scraped beef sandwich. A tender sweetbread. Bread and milk. A poached egg. Wine jelly or calf's foot jelly. Macaroni.

*Sixth Day.*— Mush or crackers and milk, scrambled eggs, chicken jelly. Bread and butter. The soft parts of raw oysters.

*Seventh Day.*— A small piece of tenderloin steak or a little breast of boiled chicken. Bread and butter. Boiled rice. Wine jelly. Sponge cake and whipped cream.

*Eighth Day.*— A slice of tender rare roast beef, a thoroughly baked mealy potato served with butter or mashed with cream. Other food as before.

*Ninth Day.*— A little broiled fresh fish for breakfast. Beef steak for dinner. Rice, macaroni, eggs. Sago, rice, or milk pudding. A baked apple.

*Tenth Day.*— Mush and milk. A squab or breast of partridge or roast chicken. Other foods as before. Ice cream.

For the next four or five days the patient may select articles from the *menu* of the previous day, so that three good meals a day are taken, besides three or four glasses of milk between meals.

It is often desirable to give a little alcoholic stimulant, especially if there is much difference in the frequency of the pulse between lying and sitting and standing, or if the pulse rate is very low, say fifty-six, as it sometimes is. A glass of sherry or a good sound Burgundy or a tumbler of ale may be drunk, but with the meals only.

---

May I reach

The purest heaven — be to other souls  
 The cup of strength in some great agony,  
 Enkindle generous ardor, feed pure love,  
 Beget the smiles that have no cruelty.  
 Be the sweet presence of a good diffused,  
 And in diffusion ever more intense!  
 So shall I join the choir invisible,  
 Whose music is the gladness of the world.

—George Eliot

---

Others are affected by what I am and say and do. And these others have also their sphere of influence. So that a single act of mine may spread in widening circles through a nation of humanity.— *W. E. Channing.*

**"LACTACID MILK IN INFANT FEEDING" \***

BY CHARLES EDGERTON CARTER, M.D.,

*Instructor in Medicine, Department of Pædiatrics, Post Graduate Medical  
School*

RESUMÉ

(1) Lactacid milk is obtained from clean, fresh cow's milk, fermented by the lactic bacillus, isolated by Cohendy in 1903, and which he describes as not "growing under thirty-five degrees Fahrenheit nor sixty-three degrees Fahrenheit." The degree of acidity is limited by the time allowed for the activity of the bacilli.

(2) Buttermilk feeding and lactacid milk feeding are absolutely distinct. The former affords an uncertain and temporary expedient always, and being a spontaneously sour milk contains, besides the lactic ferments, generally yeasts which produce alcohol.

(3) In infant feeding the frequent desideratum of high proteid percentages may be found not only possible, but also safe, with lactacid modification of milk.

(4) The digestive enzymes of natural milk are not killed as in the unnatural processes of sterilization or even in Pasteurization, but are augmented by the *Bacillus bulgaricus*.

(5) Lactacid milk is logically indicated in children: *a*, In difficult feeding cases; *b*, in fermentative diarrheas; *c*, in specific enteric infections of typhoid or tuberculous bacilli.

(6) From the extremes of the scientist and the enthusiast, from Herter and from Metchnikoff, come corroborative evidence that lactic acid inhibits intestinal putrefaction.

(7) Promulgation of the general desirability of undiluted lactacid milk as a beverage can but lessen the ills that flesh is heir to, even if it cannot accomplish, as Metchnikoff hopes, the prolongation of man's allotted span.

(8) The writer presents this as a preliminary communication, and will later submit a series of results obtained in indicated cases of lactacid milk feeding.

\* *New York Medical Journal*.

# EDITORIALS

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### THE DIETETIC AND MEDICINAL USES OF SALT

THE universal craving for salt, on the part of both men and animals, constitutes a strong argument in favor of its value, and even its necessity, as an article of diet. The Indians of North America would endure hunger, fatigue, and danger, to satisfy this craving. Stanley tells us that in Darkest Africa the natives were accustomed to travel many miles under great difficulties to obtain a coveted supply of salt. Letherby relates that on the Gold Coast of Africa a handful of salt is the most valuable thing on earth after gold, and will purchase a slave or two; while on the coast of Sierra Leone, brothers will sell their sisters, husbands their wives, and parents their children, for salt. Mungo Park says that with the Mundingas and Bambaras the use of salt is such a luxury that to say of a man that he flavors his food with salt is to imply that he is rich. In Muscovy no stronger mark of respect or affection can be shown than the sending of salt from the tables of the rich to their poorer friends.

Animals or men who are deprived of salt for a long time suffer greatly as a result from indigestion and malnutrition. The tissues become flabby, the muscles feeble, the hair falls out, the skin becomes dry and harsh, and the mind dull and stupid. Boussingault experimented with six young bulls,

giving to three of them an abundance of salt with their food, and withholding it from the other three entirely. For the first two weeks no difference was observable, but at the end of a month it was noticed that in the animals from whom salt had been withheld the hair was dull and erect, while in the others it was smooth and shining. At the end of a year, in the animals which had not been supplied with salt the hair was matted, and in places it was fallen out, giving to the skin an unhealthy appearance; while on the contrary those who had received an abundant supply of salt were lively, their skins were smooth and shining, and their whole appearance indicated that they were in good condition.

It is not practicable at the present day to observe in man the effect of an entire deprivation of salt from the food, unless some one should voluntarily subject himself to the experiment of denying himself the use of it. In view of the great suffering caused by such a course, it is not probable that any one will willingly undergo the discomfort and even torture which such a course would involve. It has been reported, however,—on how good authority we are unable to state—that several centuries ago in Holland it was customary to punish certain crimes by confining the offenders to a diet of bread and water, with an entire deprivation of salt. Under the circumstances the criminals were said to have become insane, then idiotic, and finally to have died.

Herbivorous animals are more dependent upon salt than are the carnivorous ones—probably because the food of the former in its natural state, such as grass, grain, and vegetables in general—contains less salt than does the flesh food of the latter.

On the other hand, an excess of salt in the diet is injurious in several ways. It may prove a local irritant to the gastric and intestinal mucous membrane. It modifies the rate of absorption and changes the reaction of the digestive fluids. After being absorbed it may interfere with nutrition and the chemical processes going on in the blood and the tissues. The prolonged use of an excessive amount of salt in the diet produces hyperchloridia with its attendant phenomena. Even the ordinary use of salt is credited by one writer with being a fruitful cause of cancer.

Salt stimulates the appetite, and increases the secretion of gastric juice. Especially does it increase the amount of hydrochloric acid in the gastric juice, by furnishing the necessary amount of chlorine therefor. On the other hand, Cohn and Voit have proved that the absence of salt from the diet completely checks the secretion of hydrochloric acid in the stomach. A salt-free diet lessens the acidity of the gastric juice, while the prolonged use of a very salt diet, especially with the addition of salty enemas or injections, gives rise to an undue acidity of the gastric juice, or hyperchloridia.

Salt is of great service as a preservative of foods, preventing decomposition, and preserving the tissues from decomposition and putrefaction. So

when taken into the system it tends to preserve and support existing forms and compounds in nature, acting as a practical antiseptic.

It is now quite generally taught that in epilepsy a salt-free diet is conducive to a lessening of the convulsions. I am not aware that any explanation has been undertaken of this result, other than that by substituting the bromide of sodium for the chloride of the same, the system is more readily brought under the influence of the bromides. It is probable that this is the case, as I have myself noticed, in a case where all bromides were injurious, that the same effect was produced even by the small amount of bromine contained in the sodium bromide which was used as a substitute for common salt. And in this case a return to a normal dietary to the extent of using food as cooked for the family use, but without the addition of salt as a condiment, was followed by good results.

J. M. F.

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### BOOK REVIEWS

ALL books reviewed in this department will be sent postpaid, upon the receipt of the quoted price. Send money order or bank check, making payable to Pitts Edwin Howes, treasurer.

*The Aix-Les-Bains Thermal Treatment*, The Douche-Massage, by H. FORESTIER, M.D., Physician to the Bathing Establishment, to the Thermal Hospital, and to the Evangelical Home of Aix-Les-Bains; Laureate of the Academy of Medicine of Paris; Fellow of the Royal Society of Medicine, London, 12mo, 65 pp., 60 cents net. J. & A. Churchill, London, P. Blakiston's Son & Co., Philadelphia, Pa.

This booklet describes very concisely and yet very intelligently the method of giving the "Douche-Massage" treatment of this famous Spa of Europe. To those physicians who are at all interested in the treatment of disease by the "hydro-therapy" method this little book will prove very interesting reading. The full-page illustrations aid materially in understanding the method used in giving the treatments. The chemical composition of the waters are fully explained.

*The Mellin's Food Method of Percentage Feeding*, dedicated to the Physicians of the United States, who are taking an increasing interest in Infant Feeding and who have so generously recognized the merits of Mellin's Food. Small quarto, 183 pp., cloth. From the press of Mellin's Food Company, Boston, Mass.

This little work is indeed a valuable contribution to the science of Infant Feeding and should be in the hands of every physician who is at all interested in the correct and scientific method of adapting the different percentages to different children. The book will be sent to any physician who sends his address to the publishers with a request for a copy.



The method of using the various tables are fully explained, and, by a small amount of study, the physician can readily find the information needed.

*The International Medical Annual, A Year Book of Treatment and Practitioner's Index, 1908.* E. B. Treat & Co. Price \$3.

This is the twenty-sixth consecutive number of the best of the annuals. It gives a concise statement of the progress of the medical sciences during the past year. Among the sections which will be considered as of especial value by the general practitioner are those giving a review of the therapeutic progress of the year, a dictionary of remedies, a discussion of opsonins and vaccines, treatment by passive hyperæmia, medical and surgical progress, a dictionary of treatment, sanatory science in 1907, and the books of the year. The physician whose library contains this annual will be sure to make use of it for constant reference, and will seldom be disappointed in finding what he seeks in the line of medical progress. J. M. F.

*The Sexual Instinct. Its Uses and Dangers, as affecting Heredity and Morals.* By JAMES FOSTER SCOTT. Second edition, revised and enlarged. E. B. Treat & Co. Cloth. Price not given.

It is difficult to speak too highly of this work. Written on a subject not easy to treat satisfactorily, it is beyond criticism. The character of the work and the manner in which it is written show that its author is not only a physician, but a gentleman. The book is not only a strictly scientific presentation of the sex question from the standpoint of the physician, but it is also a safe, sound, and sensible statement of the facts from the point of view of a layman. It is as simple in its language and as easily understood as such a book can well be made. It can be put into the hands of any person of ordinary understanding, with the certainty that it will tend to purify the animal nature, restrain the passions, and build up character, rather than the reverse, as is the case with so many works of the kind. J. M. F.

*Case Teaching in Medicine.* A series of graduated exercises in the differential diagnosis, prognosis, and treatment of actual cases of disease. by RICHARD CABOT, M.D. (Harvard). D. C. Heath & Co., Boston. Cloth, \$1.50.

Of few books is it safer to speak well than this. Every physician, young or old, may well wish that it had been his good fortune to have been taught by such a teacher as Cabot, along such lines as he has here developed. It is not a book for casual reading, but for careful study. A brief record of seventy-eight cases is given, the facts being briefly but clearly stated, after which the teacher questions his pupils as to the significance of the main points in the personal and family history of the patient, and the signs and symptoms of disease. A diagnosis is then developed, followed by the prog-

nosis and treatment. A large proportion of the cases end either with an autopsy or an operation, and these have been selected, because in case-teaching it is essential to be able to make a positive diagnosis, which is only possible in a large proportion of cases when some one has actually seen, either before or after death, the result. As a book of practical lessons in the art of making a diagnosis, it is of great value, and its careful study will be of benefit to every medical student and physician. J. M. F.

*The Nature of Man.* Studies in Optimistic Philosophy, by ELIE METCHNIKOFF, Professor at the Pasteur Institute. G. P. Putnam's Sons. Cloth, \$2.

Elie Metchnikoff is one of the most distinguished of the disciples of Pasteur. He was born in Little Russia, in 1845, and has been at the Pasteur Institute since 1888. He is one of a little body of men who, forsaking the world and the things of the world, as most men count the world, have devoted themselves to the cause of science, to the end that they may add to the world's store of truth, and bring new hope to suffering humanity. This book, which the author regards as a program of work laid out to be done rather than a report of work already finished, is addressed to disciplined minds, and especially to biologists. Notwithstanding this, it is written in a charmingly simple style, and is open to the comprehension of every well-trained medical man. Its main theorem is what the author calls Disharmonies in the Nature of Man; including a consideration of those religious and philosophical systems which have been put forth as attempts to diminish the ills arising from these disharmonies, and a further setting forth of "what Science is able to do to alleviate the disharmonies of the human constitution." J. M. F.

*Borderland Studies:* Miscellaneous Addresses and Essays Pertaining to Medicine and the Medical Profession, and their Relation to General Science and Thought, by GEORGE M. GOULD, M.D., formerly Editor of The Medical News, The Philadelphia Medical Journal, American Medicine; Author of a Series of Medical Dictionaries, Biographic Clinics, etc., pp. 311, cloth, 12mo. Price \$1.50 net. P. Blakiston's Son & Co., Philadelphia.

This is the second volume of these "Studies" and the fourteen essays, lectures, and addresses of which it is composed make it a book which will receive a hearty welcome among medical men in every clime. The author is too well known to need any great pæans in his behalf. Every physician should own this book and make it his friend. The result must be uplifting, and therefore the profession at large become more noble.

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No. 12.

## SOME HEADACHE REMEDIES

*Spec. Med. Avena Sativa.*—Whenever any of your neurasthenic patients present themselves with a headache that is located in the occipital region this remedy may be used with good results. Also think of it in the nervous headache, or sick headache that is often seen during the menstrual period, especially if these are associated with a burning pain on the top of the head. Dose;  $\mathfrak{J}\text{i}$  to  $\mathfrak{J}\text{ii}$  should be added to  $\mathfrak{J}\text{IV}$  of water and teaspoonful doses given every two to three hours.

*Arom. Spts. Ammonia.*—If you are called upon to treat a patient with a sick headache that is caused by an accumulation of gas either in the stomach or intestines do not forget that relief can be obtained by administering five to fifteen drops of this agent every one to three hours according to the severity of the pain.

*Spec. Med. Guarana.*—A headache that is accompanied with a pallid face and is intensified by motion should be treated by this drug. It may be given in X gtts. doses and repeated every hour.

*Acetate Potassium.*—When there is a headache distinguished by a dull heavy pain all over the head, with torpidity of the kidneys, and a tongue which presents a pallid hue, full in shape and coated with a pasty fur this remedy will be beneficial. It should be given in ten grain doses every two or three hours.

*Spec. Med. Sticta.*—A headache that is characterized by occipital pain which is increased by motion of the head, and accompanied by pain in the shoulders and neck will be relieved by the Sticta. Add XV gtts. to  $\mathfrak{J}\text{IV}$  of water and give in drachm doses every one half hour to every two hours as indicated by the degree of pain.

*Podophyllin 2x.*—Your patient tells you that the head is dizzy and feels heavy. You find the tongue full and covered with a yellowish coating, more extensive at the base, and the abdomen feels full. Three grains of the 2x of this drug should be given to such a patient every two hours until all the unpleasant symptoms have passed away.

*Spec. Med. Iris.*—A sick headache that is produced by eating sweets and pastry, and combined with nausea, can be relieved by this agent. It should be given in doses of two to five drops every one to two hours until the patient is relieved.

# DEPARTMENT OF THERAPEUTICS

## SOME INFLUENCES OF THE STRENUOUS LIFE

LYDIA ROSS, M.D., WATERTOWN, MASS.

The medical vision has been so closely accommodated to the detailed study of laboratory pathology, it may rest the professional eye to briefly sweep out over a broad outlined sketch of prevalent general conditions.

The strenuous modern life is so variously different from the methods of even a generation ago, it would be strange if the change was not reflected in the general type of pathology. The modern nervous system has rapidly grown more highly organized as it must needs do to serve as an efficient medium between the restless, eager, planning mental man and the responsive physical organism that actively executes the many plans. Like any other highly-developed piece of mechanism the nervous system is not only more capable and powerful, but, because of its increased complexity and skill, it is correspondingly more easily thrown out of adjustment and injured. In view of this fact, it is not surprising to find that while improved sanitary activities have lessened the recognized contagious diseases, the mental, nervous, and psychic diseases and disorders are rapidly increasing. In this connection it is also noteworthy that there is an increase in the diseases which, though not to be classed as nervous types, are yet related to disturbances of metabolism which is dependent upon the functioning of that subconscious actor — the sympathetic nervous system. For instance, Bright's disease and diabetes are both recognized as becoming more frequent, especially in the better classes of society among the busy, hurried, worried citizens of the strenuous life. Surely there is not more occasion for anxiety among these educated, active, resourceful men and women than among those who are ignorant, unemployed, and poor. But broadly considered the nervous systems of those who are adjusted to a broader and better type of living are more easily jarred out of functional tune by the prolonged discordant strain of social and financial striving. The very development of the nervous system requires for its normal activity a quality of life worthy of its enhanced powers and possibilities. Diabetes is often found in neurotic temperaments. Van Noorden states that London statistics show it to be ten times more common in the upper classes than in the lower. The morbid diabetic anatomy shows no constant lesions of the nervous system; but the other pathological findings may easily seem related to a disturbed metabolism from faulty nervous innovation.

Bright's disease is notably frequent in tense, active, often successful business men. The insidious nature of its attack in these patients, when it is often accidentally discovered or found only when near a fatal termination, is typical of the gradual breaking down of functional cells under prolonged strain. The look of nervous tension in the pale or sallow face of the average metropolitan business man shows that the skin capillaries are contracted by the heightened activity of their sympathetic nervous supply. As the exchange of nutrition and waste from the blood to and from the organs takes place in the capillary area, it is reasonable to suppose that the visible superficial capillary anemia is also prevalent in the internal capillaries of organs. It is known that a lack in the supply of oxygen to the secreting epithelium of the kidneys soon affects their nutrition and function. So that a continued condition of modified renal asphyxia from contracted capillaries must influence the functional value of kidney cells and might largely account for the degenerated epithelia which are found in the diagnostic casts.

In line with this question of lowered resistance of vital tissues from nervous tension we may regard the significant tabulated reports from various cities showing the increasing mortality from pneumonia. Neither the therapeutic nihilism of Osler nor the average malpractice in treating pneumonia can account for these depressing figures, since the disease is at least not less scientifically treated than it was when less fatal in proportion to the population. In contrast to this, tuberculosis is decreasing under an improved hygiene. It may not be pathologically demonstrable that the change in ratio of these two diseases is related to the modern quality of development; but in a broad way the brief, intense pneumonia seems a more consistent ending to the strenuous life than the prolonged, milder downward course of tuberculosis. The real, old-fashioned cases of consumption are infrequent, and by the way, are they found in any but the deliberate, old-fashioned type of patient? The modern lung is not destroyed by a slow contraction into fibroid tissue. In fact the bones and connective tissues are not the points of increased attack so much as those wonderful centers of functional activity — the epithelia — and the more highly-organized tissues generally. Even though the unparalleled search for a cancer germ should succeed in finding one, may it not prove but an incidental factor in a malignant pathology where an abnormal quality of subconsciousness has animated normal epithelia into pathological activity.

In considering the modern quarantine and care of contagious diseases and the prevalence of aseptic treatment medically and surgically, it is a question whether, with all the benefits resulting therefrom, the same amount of care would not have returned far larger results a decade or two ago. That is to say, are not the sensitized tissues operated by the developing modern brain and nervous system more susceptible to contagions

and is not the increased potency of the organism capable of auto-development of more activity in septic and malignant types of disease?

This mere outline of thought upon the influences of the strenuous life is offered that each physician may fill in the sketch with his personal reflections and opinions.

## STRYCHNIA

BY WM. H. RUSSELL, M.D., IPSWICH, MASS.

PERHAPS the title of this paper should be "Reliable Heart Remedies." Strychnia is one of our most reliable heart remedies; a remedy to be depended on in cases of emergency. All physicians know the derivation of strychnia. I shall not burden the hearer with a long description of the physical properties of the drug, which may be found in any textbook.

Until recently, strychnia was used almost exclusively as a tonic and stimulant in rundown conditions, and as a nerve stimulant in paralysis. At the present, strychnia is the popular heart tonic, being prescribed in pneumonia, typhoid fever, or any condition where there is exhaustion and a weak and failing heart. It is probable that the action of the drug is manifested through the nerves which supply the heart muscles; the nervous system is supported and the heart muscle strengthened at the same time.

Strychnia is a valuable heart tonic when indicated, and may be given in the form of tablets, as the sulphate, or may be given in trituration. Some patients have an idiosyncrasy towards strychnia. In these cases the 1, 2, or 3x trituration might be tried. If the patient becomes excited or has a violent headache after taking strychnia, give it in a milder form, if indicated. In the nerve depression following la grippe, strychnia is a valuable remedy. In acute heart failure, a hypodermic of gr. 1-30 to gr. 1-20 of strychnia sulph. will strengthen the weakened heart, and save life.

Adrenalin, one tablet, three two-hundredths gr. in fifteen mimos of water is the quickest acting heart tonic which we have at our command to-day. It is a reliable remedy in heart failure and may be relied on in the failing heart of pneumonia.

Atropine sulphate, hypodermically, is a reliable remedy in respiratory failure, dyspnoea, with failing heart.

Caffeine citrate is a reliable remedy in heart failure, should be given alternately with strychnia, or after adrenalin, or strychnia.

Nitro-glycerine is a vaso-motor dilator. The primary action of glonoin is to *contract* the heart muscle, secondarily to *dilate* the heart muscle; to flush the capillaries, is therefore contra-indicated in cardiac dilatation, and relaxed condition of the arterial system; never given in sthenic cases

(full-blooded cases). The above may be classified as emergency remedies.

Digitalis is not an emergency remedy; it requires two or three days to get the mechanical action of the drug on the heart muscle. Digitalis contracts the heart muscle, causing the heart to beat slower, also contracts the arteries; should be given in conjunction with a vaso-motor dilator (nitro-glycerine). Digitalis should never be given until compensation has failed. Any physician who is not competent to make a physical examination of the heart should not use digitalis. This is a dangerous remedy when wrongly used, and will kill or injure the patient.

Strophanthus is a safer remedy and may be used in valvular disease where digitalis is contra-indicated.

Crategus is of no value as a heart remedy. It is said to be of benefit in functional heart disease, but paradoxical as it may seem, functional heart disease is not heart disease at all, but a nerve disease.

Cactus may have a feeble action as a contractor of the heart muscle, but the indication for the remedy is a sensation as if the heart was being grasped and squeezed.

In classifying the action of heart remedies, we should ever have in mind the emergency remedies, like adrenalin, strychnia, nitro-glycerine, atropine, and caffeine citrate. The action of these remedies is mechanical. A working knowledge of a few well proven remedies is of far more value than a theoretical knowledge of a hundred remedies which pad the textbooks on *Materia Medica*.

## A STUDY OF THE TWELVE TISSUE REMEDIES

BY JOHN WILLIAM FYFE, M.D., SAUGATUCK, CONN.

### NO. VII. KALI SULPHURICUM — POTASSIUM SULPHATE

THE sulphate of potassium often constitutes a remedy of decided usefulness. An eminent investigator of drugs says that it is the function remedy of the epidermis and of the epithelium, and that a deficiency of this salt causes a yellow slimy deposit on the tongue, decidedly yellow or greenish discharges, secretions of watery matter from the mucous surfaces, and epithelial or epidermal desquamation. It is believed that the yellowness is due to fatty degeneration of inflammatory products and of effete epithelium. It is especially indicated in all abnormal conditions caused by retrocession of eruptions.

Kali sulphuricum has been employed with marked advantage in rheumatic arthritis, especially where the pains settle in one joint and then in another, and in rheumatic fever it is deemed a remedy of curative power.

"In wandering, shifting muscular pains of a rheumatic or neuralgic character, worse in the evenings or heated rooms, and in cases of long standing rheumatism with debility and soreness of muscles, this remedy sometimes works wonders.—"(Kinnett.)

In bronchial asthma, with yellow expectoration, the sulphate of potassium has been employed with very satisfactory results, and in bronchitis when the expectoration is distinctly yellow, watery, and profuse, or when it is greenish, slimy, and watery, this drug exerts a needed influence. It is also an efficient remedy in diarrhoea when the stools are yellow, slimy, watery, or purulent, and the tongue has a yellow coating, especially at its root, as well as when the discharges are black, thin and offensive.

In affections of the eyes indications for kali sulphuricum are often seen. In cases in which the eyelids are covered with yellow crusts, or in which there is a discharge of yellow or greenish matter, with purulent slime, or yellow, watery secretions, it constitutes a remedial agent of corrective power. In ophthalmia neonatorum, especially when there is a thin yellow or sanious discharge, with closely adherent membrane on the palpebral conjunctiva, it has often been employed with curative effect, and in some cases it has proved useful after other approved remedies have failed. It is also deemed an agent of merit in abscesses of the cornea, and especially so in cases of pus in the anterior chamber.

Kali sulphuricum constitutes a medicament of great value in chronic catarrh of the stomach, especially when the tongue is covered with a yellow coating, and in dyspepsia, when the tongue has a yellow coating, and there is a sensation of pressure as of a load and fullness at the pit of the stomach, its action is curative in its direction. It is also useful in cases of indigestion characterized by a gathering of water in the mouth.

"Kali sulphuricum is a very good remedy in chronic catarrh of the stomach where the tongue is slimy and coated yellow. In all these cases where the water accumulates in the mouth, natrium muriaticum should be prescribed with it. Pain that commences in the stomach and wanders through the intestines and finally settles in the right hip just above the crest of the ilium, will be relieved by this remedy."— (Palmer.)

In jaundice caused by gastric catarrh it exerts a needed influence, and in scarlet fever when there are discharges of foul ichorous pus from the ears, or fetid discharges from any of the mucous surfaces, its corrective action is unmistakable. In gleet and old cases of gonorrhea it has been used with marked success, and in leucorrhea when the discharge is yellow, greenish, slimy, or watery, the sulphate of potassium is deemed a remedy of superior merit. It is also useful in pathological conditions which sometimes follow scarlatina, and especially when the urine is albuminous.

In the eruptive diseases, when the eruption is suppressed, or suddenly recedes, and there is a harsh and dry skin, kali sulph. has often acted correctively.



In metorrhagia, or when the menses are too late and too scanty, with weight and fullness in the abdomen accompanied by headache and a yellow-coated tongue, kali sulphuricum is often employed with more than ordinary success. Tuberculous ulcers, with continuous oozing of pus and lymph, are often much improved by the use of this drug.

In inflammation of the lungs, especially when loose yellow rattling phlegm, or watery mucous is coughed up, the sulphate of potassium exercises a most desirable influence, and in rattling cough accompanied by a suffocative sensation, its action is relieving in character.

A further study of the sulphate of potassium is likely to develop some valuable specific indications, and the following, taken from Fyfe's *Materia Medica*, suggest the lines along which such study should be pursued:

'Yellow coating on the tongue; diarrhea when the discharges are yellow, greenish, and slimy; menses tardy, and scanty, with a feeling of weight and fullness in the abdomen and a yellowish coating on the tongue; bronchial asthma, with yellow expectoration; bronchitis, when the expectoration is distinctly yellow, greenish, slimy or watery and profuse; catarrhal cough, with free yellowish expectoration; intermittent fever, with yellow, slimy coated tongue; eczema, when the discharge is yellow, greenish, and watery; burning or itching papular eruption; tuberculous ulcers, with a continuous oozing of yellow pus and lymph.'

The dose of the third trituration of the sulphate of potassium is from two to five grains, but in most cases the best results from its administration can be obtained by prescribing the drug as follows:  $\mathcal{R}$  kali sulphuricum, 3x, gr. xx to  $\mathfrak{z}$ i; water  $\mathfrak{z}$ iv. Teaspoonful every hour.

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Oh! What a glory doth this world put on  
 For him who with a fervent heart goes forth  
 Under the bright and glorious sky, and looks  
 On duties well performed, and days well spent;  
 For him the wind, ay! and the yellow leaves,  
 Shall have a voice and give him eloquent teachings.  
 He shall so hear the solemn hymn, that Death  
 Has lifted up for all, that he shall go  
 To his last resting-place without a tear.

— Longfellow

## FIRST STEPS IN MEDICAL ELECTRICITY

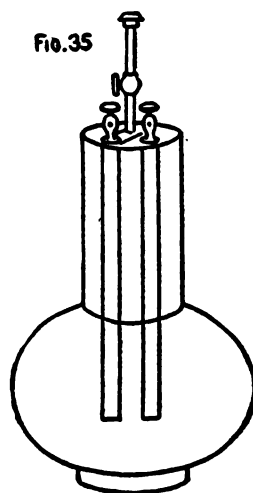
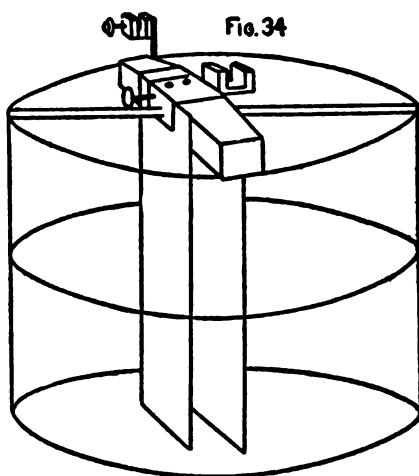
BY HERBERT MCINTOSH, A.M., M.D., BOSTON, MASS.

### CHAPTER VI

#### PRIMARY BATTERIES. STORAGE OR SECONDARY BATTERIES. DYNAMO MACHINES. TRANSFORMERS.

*Polarization.*—A great reduction in the effectiveness of voltaic cells is occasioned by the polarization of the negative plate. We have already seen in Chap. II, on the physics of the direct current (Fig. 9), that hydrogen appears at the negative plate. These bubbles after a time completely cover the plate, and ultimately destroy the difference in potential between the two plates. This reduction is accomplished in two ways. In the first place hydrogen is a poor conductor, and in the second place, as hydrogen is electro-positive it forms with the copper a galvanic couple producing a current almost as strong as that between zinc and copper, and in an opposite direction. To get rid of these bubbles many devices have been adopted, which may be classified as (a) mechanical; (b) chemical; (c) electro-chemical.

(a) *Mechanical Devices.*—Under this head may be included the brushing away of the hydrogen bubbles as they appear on the negative plate, or carrying air through, or revolving the plate in, the exciting fluid. These methods are unsatisfactory and as a partial solution of the problem Smee's battery (Fig. 34) was constructed, in which a silver plate covered with a rough surface of finely divided platinum is substituted for the copper plate. From these points the hydrogen bubbles readily escape, but not with sufficient rapidity to maintain a powerful current.



(b) *Chemical Devices.*— In this method a highly oxidizing substance such as bichromate of potassium, bleaching powder, or nitric acid is added to the solution to oxidize the hydrogen as soon as it is formed. The bichromate battery (Fig. 35) illustrates this principle. To make the solution five fluid ounces of sulphuric acid are poured into three pints of water, and when this is cooled six ounces of powdered bichromate of potassium are added. This solution will attack copper; therefore carbon is substituted and as it will also attack zinc, a rod is provided by which the zinc plate may be raised out of the liquid when the battery is not in use. This battery gives a strong current when used for a short time, but it is not very successful in checking polarization.

The Leclanché battery undertakes by the same method to overcome polarization. It employs zinc and carbon elements, combining the latter with powdered binocide of manganese, — a substance which slowly yields oxygen and thus destroys the hydrogen bubbles, — and an aqueous solution of sal-ammoniac.

One form of this battery (Fig. 36) places the zinc element between two compressed prisms of carbon and binocide of manganese, and a later type (Fig. 37) omits the use of the latter entirely. As this battery is used chiefly upon so-called open circuits for house and hotel annunciators, for burglar alarms, etc., where occasional or momentary use is required, it serves its purpose admirably, demanding little attention and furnishing a current of about 1.5 volts.

(c) *Electrochemical.*— This method takes advantage of the power which the electric current possesses of depositing metals from solutions of their salts upon the negative plate. For this purpose double cells are

Fig. 36

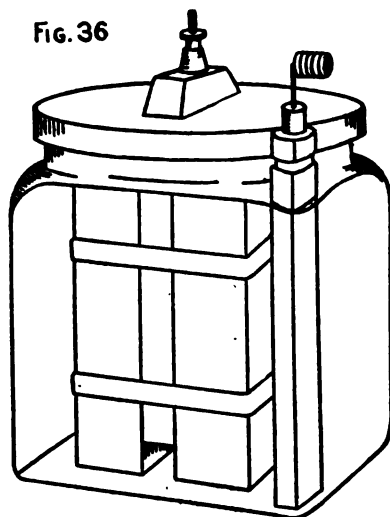
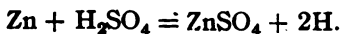
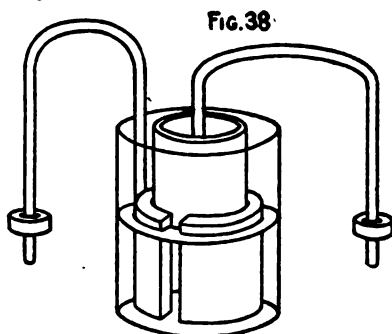


Fig. 37

required containing different fluids. Such batteries effectually prevent polarization and furnish uniform and steady currents.

This principle is well illustrated in the Daniell's battery. There are many types of this battery, but the principle is the same in all. For convenience we describe a type (Fig. 38) in which the zinc stands in a porous cup, containing dilute sulphuric acid. Outside of the porous cup is a cylindrical strip of copper standing in a solution of sulphate of copper, the whole being contained in a glass receptacle. When the current is closed, the acid attracts the zinc forms zinc sulphate, and liberates hydrogen, thus:



The liberated hydrogen now starts for the negative plate, but meets the sulphate of copper on the way, detaches the copper, and deposits it upon the negative plate, thus:

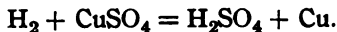


Fig. 39

The gravity battery (Fig. 39) illustrates the same principle. As the porous cup is likely to become impregnated with copper, especially if much used upon an open circuit, it may be dispensed with and advantage taken of the difference in density of

the two fluids employed. The zinc is suspended in a dilute solution of sulphate of zinc, and the copper lies at the bottom of the jar in a saturated solution of sulphate of copper. This is a most serviceable battery for continuous work, and is not liable to get out of order. Other batteries of this type are those known respectively as Grove's and Bunsen's.

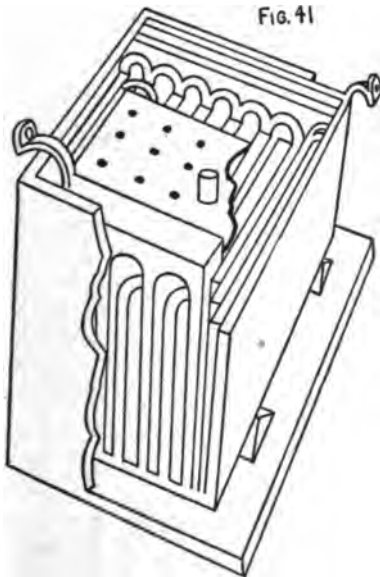
For producing the direct current for use in country districts, where the electric lighting mains are not accessible, it is customary to use from forty to fifty cells of the Leclanché type. A separate group of these cells may be used to excite an induction coil. Bichromate of potassium batteries are occasionally used for the same purpose, but the cleanliness and ease of handling of the sal-ammoniac battery are greatly in favor of the latter.

**Dry Cells.**— These furnish a convenient method of providing an electric current. They represent the Leclanché type of battery. In the usual form (Fig. 40) the zinc element is made in the shape of a canister into which a conglomerate of material — which varies in different makes — is introduced and moistened with the exciting fluid. This is packed around the carbon element in which polarization may be avoided by using binoxide of manganese, and the ends of the canister are sealed to prevent evaporation. Such cells have a long period of usefulness, but will, of course, finally run down, and as they cannot be effectually revived, must be thrown away. Like the Leclanché cell they are adapted to use on open circuits.



Fig. 40

**Accumulators or Secondary Batteries.**— These are called secondary batteries, because when run down — unlike primary batteries — they can be renewed by driving an electric current into them. They are also called storage batteries, though there is no storage of electricity, but an accumulation of potential energy ready to manifest itself as electricity.



Accumulator Cell showing arrangement of plates

As ordinarily constructed (Fig. 41) an accumulator consists of two or more lead plates immersed in a solution of sulphuric acid and water, having the proportions of one part of the former to five parts of the latter. The acid forms a layer of sulphate of lead upon the surface of the plates. If now a direct current of electricity is passed through such a battery, bubbles of oxygen will appear on the positive plate and bubbles of hydrogen on the negative. This is the now familiar effect of electrolysis, as already described in Chap. II on the physics of the direct current (Fig. 9). The nascent oxygen changes the sulphate of lead  $\text{Pb}(\text{SO}_4)_2$  to a peroxide of lead  $\text{PbO}_2$ , a dark, chocolate-colored substance, thus:  $2\text{H}_2\text{O} + \text{Pb}(\text{SO}_4)_2 = \text{PbO}_2 + 2\text{H}_2\text{SO}_4$ . The nascent

hydrogen reduces the sulphate of lead ( $\text{PbO}_2$ ) on the negative plate to a spongy gray substance, or metallic lead, thus:  $2\text{H}_2 + \text{Pb}(\text{SO}_4)_2 = \text{Pb} + 2\text{H}_2\text{SO}_4$ . When the process of changing is complete, the gases escape through the liquid rendering it milky.

If now the charging wires are detached and the poles of the battery are connected by means of a conductor, an electrical current is produced in an opposite direction, and continues until the plates are in their original condition. The accumulator may be recharged and the process repeated indefinitely. The accumulator reaches its maximum of efficiency when the layer of material upon the plates has acquired a certain depth and porosity.

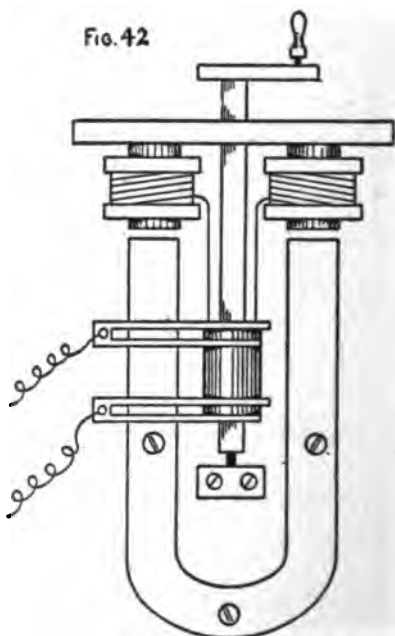
Secondary batteries supply a powerful current of about two volts per cell. Their capacity is generally expressed in ampere hours, that is, the number of hours in which the battery can be discharged at the rate of one ampere per hour. Thus, if an accumulator has a capacity of twenty-four ampere hours, we may derive from it a current of two amperes for twelve hours, or one ampere for twenty-four hours.

Accumulators may be charged by a primary battery, dynamo, or from the direct current electric lighting mains.

*Magneto-Machines.*—The demand for larger currents than can be furnished by galvanic batteries and accumulators has led to the application of principles, already on the physics of coil currents, to the construction of machines capable of delivering currents of great volume and intensity.

We there saw that if a core of soft iron be placed inside of an induction coil connected with a galvanometer and one of the poles of a bar magnet be waved back and forth over the extremity of the core, the needle of the galvanometer was violently agitated, being moved in one direction at the approach of the magnet, and in an opposite direction at its departure, and that if the opposite pole was used, the movements of the needle were exactly reversed. The same results obtain if the magnet is stationary and the coil is moved.

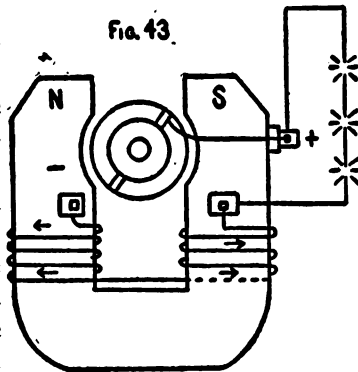
We may, therefore, construct a magneto-electric machine (Fig. 42) consisting of a permanent horseshoe magnet and two helices enclosing soft iron bars, having their wires wound in opposite directions and attached to an armature. The helices and armature are rigidly attached to a shaft which is turned by a crank. When the shaft is turned the armature with its helices moves away from the poles and a current of electricity is established in both helices. As the wires in the helices are wound in opposite directions, the currents flow in the same direction and are doubled. During the second quarter revolution the poles approach each other. We should now



expect a reversal of the current in the helices, but the polarity of the soft iron cores changes also, thus preserving the original direction of the current. At the beginning of the third quarter revolution there is a reversal the current, because the polarity of the cores does not change. It thus appears that at each revolution the current runs in one direction half the time and in the opposite direction the other half. In order, therefore, to secure a constant current, a current reverser or commutator is placed on the shaft and connected with the terminals of the helices by means of brushes.

The commutator is composed of strips of metal insulated from the shaft and from one another, and so arranged that opposite currents are delivered in the same direction. Such a machine produces a continuous current.

*Dynamo Machines.*—The machine described above serves to explain the principle upon which magneto-electric machines work, but is not generally in use for generation of direct currents. For this purpose the principle of the electro-magnet is employed, as illustrated in (Fig. 43). Here the currents generated by the rotation of the armature are employed to magnetize the soft iron horse-shoe. This is called the field magnet, and the small quantity of residual magnetism remaining in it serves to set up currents in the armature when it is revolved. These currents passing round the field magnet still further increase its magnetism. The increased magnetism of the field magnet exerts an increased effect upon the armature, and thus by the reaction of the armature upon the field magnet, the latter becomes fully magnetized. The arrangement above described for reversing the currents by means of commutator segments and sending them in one direction is also here employed.



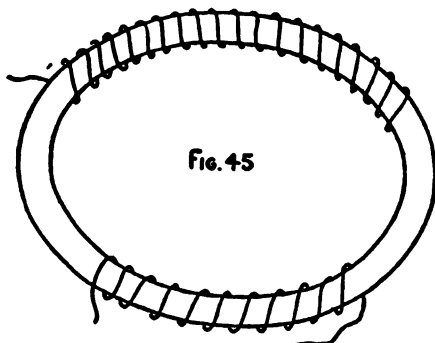
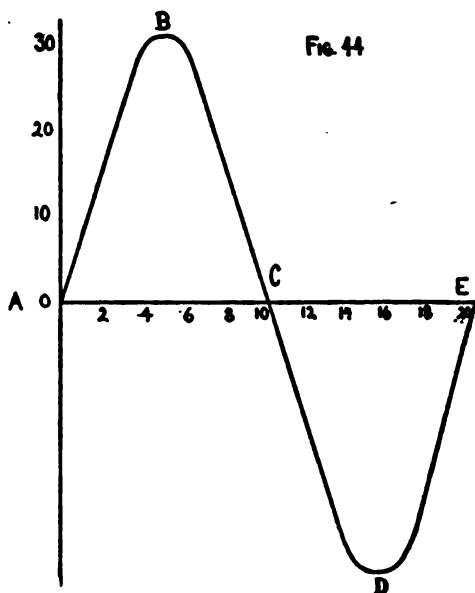
When the whole current passes first through the field magnet coils and then through the outer circuit, the dynamo is said to be "series wound." when a portion of the current is in parallel and passes through the field magnet coil, the dynamo is said to be "shunt wound."

*Alternating Dynamos.*—When the commutator strips or segments are replaced by two insulated metal rings on the shaft, the dynamo delivers an alternating current. In other words, the current is not continuous, but rises and falls with a wavelike motion. When a closed coil or circuit is rotated in a magnetic field, it is traversed by a current which rises to a maximum, then gradually falls away to zero, and is succeeded by a current of opposite sign, which rises to a maximum and falls away to zero. This

is called a "cycle," and alternating currents are characterized by the number of cycles which they make in a second. Each cycle is made up of two semi-cycles, one corresponding to the passage of the coil through lines of N magnetism, and the other to its passage through lines of S magnetism. In such machines a permanent magnet is used, or if an electro-magnet is employed, the current traversing the field magnet is derived from another source than the armature.

The variations already described may be represented graphically by a curve (Fig. 44). If a horizontal line be drawn to represent periods of time, and a perpendicular above and below the horizontal line to represent electromotive force, then an electromotive force gradually rising from zero and falling again could be represented by a curved line, and a continuation of the curved line below the horizontal line would indicate the reversal of the sign.

Thus in (Fig. 44) the curve A B C rises from zero to its maximum of thirty volts, then falls to zero, and continuing as C D E falls to its maximum of thirty volts negative and returns to zero, the periods of time of the whole cycle being represented by the horizontal line A E. This curve approaches closely to the curve of an alternating system of electric light supply, and is known as a simple periodic curve or a sine curve. Thus the current from an alternating current dynamo is often called a "sinusoidal" current, because its curve approximates in its wave form to a true sine curve.



*Transformers.*— Alternating currents are extensively employed, because of the ease with which their voltage can be changed by means of transformers. In direct currents resistances are interposed to reduce the pressure. These resistances consume the current but do not transform it. The ease with



which alternating currents lend themselves to transformation renders these currents commercially very popular and relatively cheap. Thus a current of fifty amperes at one volt may be transformed into a current of one ampere at fifty volts, or one one-thousandth of an ampere at fifty thousand volts with slight losses.

These changes are affected by means of an apparatus called the transformer. This consists of two coils wound like an induction coil or on opposite portions of a soft iron ring (Fig. 45). The current is passed into the primary wire from the alternating dynamo, and a current induced in the secondary wire. No interruptions are required as these already exist in the alternating currents. The change in the character of the current induced depends upon the ratio of the number of

turns of wire in the two cells. Thus where a large amperage and a small voltage are required, as in electro-cautery lamps, it can readily be perceived how the use of a suitable transformer in connection with an alternating dynamo would produce the desired result.

Figure 46 represents a cut of a transformer to be used in connection with an alternating dynamo for the purpose of heating cautery knives and illuminating diagnostic lamps.

*(To be continued.)*



Fig. 46.

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Honor the soul. Truth is the beginning of all good; and the greatest of all evils is self-love; and the worst penalty of doing evil is to grow into likeness with the bad: for each man's soul changes according to the nature of his deeds, for better or for worse.

— Plato

# DEPARTMENT OF DIETETICS

## THE DIETETICS OF SUGAR

BY J. A. DENKINGER, M.D., BOSTON, MASS.

(Continued from page 345.)

### SUGAR AS A DIURETIC

THERE is one more symptom following the excessive ingestion of sugar that I want to mention in this connection, and one that is rarely mentioned by writers on the subject, and that is, that excessive ingestion of sugar materially increases the flow of urine and also calls for more frequent micturition. The diuretic action is by no means limited to lactose, as some writers seem to think, as I have observed it with cane sugar, maltose, and other sugars.

### SUGAR AS A FOOD

THAT sugar is to-day one of the most useful, valuable, and popular foods is unquestioned. Its use is rapidly increasing in all civilized countries. According to Wiley, the quantity of sugar consumed in the United States in 1905, reached, exclusive of molasses, honey, and syrups, 2,632,216 tons. That the consumption of sugar is considerably in excess of the corresponding increase of population, is shown by the fact that in the year 1822 the consumption per capita was only nine pounds, whereas in 1900 it rose to sixty-five pounds, and in 1906 to seventy-six pounds per capita. Next to fat, sugar is the greatest source of heat and energy, and it is a far more agreeable as well as a cheaper fuel than fat. Children certainly like it better than fat. On account of the ease and rapidity with which it is absorbed and oxidized it is also a more quick-acting body fuel than starch or fat, and therefore of special value in relieving exhaustion. The experiments of Mosso, Harley, and others showed that the addition of sugar to their diet, materially increased their muscular energy and capacity for work and lessened or delayed fatigue. More recently Professor Schumberg was instructed by the Prussian War Office to thoroughly test the results claimed for sugar by Mosso, some of which had been questioned by other experimenters. Schumberg's experiments proved conclusively that sugar in *small doses* is remarkably well adapted to help men to perform extraordinary muscular labor. Further experiments by Prautner and Stowasser showed that sugar is particularly valuable for persons who have to

perform a single muscular effort and especially if they are obliged to do so in a state of exhaustion. Even more conclusive were the results obtained in the celebrated sugar tests carried on by the German army, the observation extending over thirty-eight days. A number of men were given ten lumps of sugar (seventy grams or about one sixth of a pound), daily, and comparisons made with men performing the same amount of work in marching and drilling, but whose food contained little or no sugar. The results were in every way to the advantage of the men using sugar, which was greatly relished throughout the period of experimentation. On long marches, it appeased hunger, mitigated thirst, a feeling of refreshment followed which helped the tired men on their way, and none of the soldiers allowed sugar were at any time overcome by exhaustion. As the results of these tests, the military surgeons recommended that the sugar ration for soldiers be raised to sixty grams daily. The Medical Department of the United States Army, after careful investigation, has also sanctioned an increase in the amount of sugar in the army ration (it is now two and two fifths ounces of sugar (seventy grams) per day, or a corresponding quantity of molasses or syrup. Mountain climbers have long ago noted that their capacity for exertion was much increased and fatigue materially lessened if they partook freely of sugar. Hutchison reports "that in certain tests carried on by rowing clubs in Holland, it was shown that the rowers who used sugar always won on account of superior powers of endurance, it seemed to counteract the bad effect of an exclusively meat diet, so that the men did not become 'stale.' In the various sports, especially when about to make an extraordinary effort, sugar is eminently useful and it is well to remember that a lump of sugar eaten occasionally, will do much to keep up the strength and prevent exhaustion."

#### SUGAR AS A SUBSTITUTE FOR FAT

"Fats and carbohydrates have the same general nutritive value to the body — they serve to supply energy. Since the amount of potential energy contained in each of these substances may be determined accurately by means of its combustion-equivalent, it would seem probable that they might be mutually interchangeable in dietetics in the ratio of their combustion-equivalent. Such in fact is the case. The ratio of interchange is known as the isodynamic equivalent and it is usually given as 1: 2.4 or 2.2, that is, fats may replace over twice their weight of carbohydrates in the diet or it will take over twice the amount of carbohydrate to equal the same amount of fat in point of energy." This, in brief, is the law of isodynamics as stated by Howell in his textbook of physiology. The theory is certainly a tempting as well as an interesting one, sugar being not only a cheaper food element than fat, but also a more digestible, utilizable, and

# DEPARTMENT

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## THE DIETETICS

By J. A. DENKINGER,

(Continued)

### SUGAR

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sugar that I want to mention  
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That we may say that a *reasonable* amount of substitution  
foods is to make up for relative fat-deficiency in the diet of both  
tries. Infants is not at all irrational in theory and quite successful in  
States. On the other hand, an unreasonable degree of fat-substitu-  
tions through sugar addition is certain to work injury. In the case of in-  
cor with poor fat-digesting capacity, a condition typical of marasmus,  
the substitution of sugar for high fats is a matter of course, I shall have  
more to say on the subject of sugar *vs.* fat, when I come to the subject of  
sugar in infant feeding.

### SUGAR IN RECTAL FEEDING

Sugar is quickly and freely absorbed from the mucous membrane of  
the large intestines, but very concentrated solutions of sugar prove irri-  
tating to the rectum and are then quickly expelled. Strauss reports that  
he has maintained patients in good condition for one, two, or three months  
with enemas composed very largely of sugar. He used dextrose (40-50  
grams in a 10-20 per cent solution). Von Leube cautions against using  
solutions containing over six per cent of sugar, which caution, I think, is  
sound. Reach found that dextrin is even better absorbed than sugar and  
does not irritate the bowel to the same extent. Reach as well as other au-  
thorities advocate the use of the dextrinized and malted infant and in-  
valid foods of commerce for purposes of rectal feeding. Starch is also

fairly well absorbed  
in quantities of 20-?

feeding sugar in excess, or to improper preparation of the sweet foods.

It is better not to serve such preparations as malted foods intended to be added to milk in too large quantities, or adding various flavors agreeable to the palate, or serving them ice-cold or frozen, or maple sugar, maltose, lactose, or honey, which are relished by most persons.

#### GASTRITIS

As well as in gastroenteritis, there is interference with digestion and assimilation, with the ingestion of sugar should be avoided. Starches and sugar are best exchanged for fruit juice, which is usually well assimilated. Very carbohydrates such as soups or gruels, are of little value when added to milk, or malted

as bread and in very large quantities.

The digestion of sugar and its assimilation cannot keep up when it is ingested in large quantity, and is either excreted by the kidneys, which is what is more likely, and as has been shown, indulgence will cause abnormal gastric or intestinal train of troublesome if not serious symptoms, such as gastric catarrh, flatulence, and diarrhea. Sugar does not destroy normal appetite; this applies particularly to the exclusion of concentrated and other sweets by children, and is one of the prominent factors in the reduction of obesity. The acids formed in the mouth by the excessive use of sweets are a frequent source of sore mouths. Excessive use of sugar has been charged with causing rheumatism, gout, certain liver troubles and diabetes, rhinitis, pharyngitis, tonsillitis, bronchitis, and a number of other diseases. This is, however going too far, although it cannot be denied that, in the case of "sugar susceptibles" or persons with decided "sugar intolerance," excessive indulgence of sugar bears some causative relation to the diseases mentioned.

Many of the bad effects ascribed to sugar are undoubtedly due to its use in larger amounts than the three to five ounces per day, taken in conjunction with other foods, which experience has shown to be digested by the average healthy adult without untoward results. Candy and sweets generally, especially when used as a relish only, should be given in small quantities only.

#### SUGAR IDIOSYNCRASY

As with other articles of diet, there is much individual difference in sugar-digesting capacity; some persons are unable to digest even a very

agreeable food. In point of practicality, there is no question that within certain limits, sugar can replace fat in the proportion laid down by physiologists. The chief reason why fat and sugar cannot be interchanged indefinitely is due to the fact already alluded to, viz: that neither fat nor sugar can be digested and assimilated without causing gastro-intestinal difficulties when the amount is increased beyond a certain point; a high percentage of fat in the diet is not only objectionable to the palate, but presents difficulties of digestion; on the other hand, the quantity of sugar necessary to replace a considerable quantity of fat is almost certain to cause abnormal fermentation, dyspepsia, and diarrhoea, necessitating a discontinuance of high sugar feeding. Of course, no one proposes to replace fat entirely by sugar, as without a certain amount of fat in the diet, abnormal states of metabolism are sure to make their appearance especially in the case of infants.

The principle of isodynamics has been applied to the artificial feeding of infants by making up the relative lack of milk fat resulting from the dilution of milk in order to reduce the amount of casein present in whole milk, by the addition of sugar. Saxhlet was one of the foremost advocates of this method, and the Heubner-Hoffmann mixture is based on the same principle. Unger speaks very approvingly of the method.

Upon the whole, we may say that a *reasonable* amount of substitution of sugar for fat to make up for relative fat-deficiency in the diet of both adults and infants is not at all irrational in theory and quite successful in practice. On the other hand, an unreasonable degree of fat-substitution through sugar addition is certain to work injury. In the case of infants with poor fat-digesting capacity, a condition typical of marasmus, the substitution of sugar for high fats is a matter of course, I shall have more to say on the subject of sugar *vs.* fat, when I come to the subject of sugar in infant feeding.

#### SUGAR IN RECTAL FEEDING

Sugar is quickly and freely absorbed from the mucous membrane of the large intestines, but very concentrated solutions of sugar prove irritating to the rectum and are then quickly expelled. Strauss reports that he has maintained patients in good condition for one, two, or three months with enemas composed very largely of sugar. He used dextrose (40-50 grams in a 10-20 per cent solution). Von Leube cautions against using solutions containing over six per cent of sugar, which caution, I think, is sound. Reach found that dextrin is even better absorbed than sugar and does not irritate the bowel to the same extent. Reach as well as other authorities advocate the use of the dextrinized and malted infant and invalid foods of commerce for purposes of rectal feeding. Starch is also

fairly well absorbed and not at all irritating and may be employed in solutions of 20-30 per cent.

#### GENERAL EFFECTS OF THE EXCESSIVE USE OF SUGAR

There is not a particle of proof that, in health, sugar, properly eaten and used in moderation, has the slightest injurious effect on health. On the contrary, taken in reasonable amounts and distributed over the daily food intakes, sugar contributes most usefully in health to the supply of heat and energy required by the body.

Unfortunately, like other articles of food and drink agreeable in taste, sugar is frequently taken in excess or after the appetite has been fully satisfied with other food. Sugar, too, differs greatly from starchy foods such as bread and potatoes, which can be ingested and digested in relatively large quantities without causing distress.

The digestion of sugar being much more rapid than that of starch, its assimilation cannot keep up with its absorption from the intestines when it is ingested in large quantity, as the result of which some of the sugar is either excreted by the kidneys, which in time is sure to result in disease, or what is more likely, and as has been stated before, excessive saccharine indulgence will cause abnormal gastric or intestinal fermentation with its train of troublesome if not serious symptoms, such as headache, dyspepsia, gastric catarrh, flatulence, and diarrhea. Sugar eaten in excess is ruinous to normal appetite; this applies particularly to the excessive use of candy and other sweets by children, and is one of the prominent factors in the production of obesity. The acids formed in the mouth by the excessive use of sweets are a frequent source of sore mouths. Excessive use of sugar has been charged with causing rheumatism, gout, certain liver troubles, diabetes, rhinitis, pharyngitis, tonsillitis, bronchitis, and a number of skin diseases. This is, however going too far, although it cannot be denied that in the case of "sugar susceptibles" or persons with decided "sugar incapacity," excessive indulgence of sugar bears some causative relation to the diseases mentioned.

Many of the bad effects ascribed to sugar are undoubtedly due to its use in larger amounts than the three to five ounces per day, taken in conjunction with other foods, which experience has shown to be digested by the average healthy adult without untoward results. Candy and sweets generally, especially when used as a relish only, should be given in small quantities only.

#### SUGAR IDIOSYNCRASY

As with other articles of diet, there is much individual difference in sugar-digesting capacity; some persons are unable to digest even a very

small quantity of sugar without suffering from some dyspeptic symptoms, others can take simply enormous quantities of any kind of sugar without any bad effect. Experience has also shown that sugar is best borne in the comparatively dilute and non-concentrated form in which it occurs in nature, as in the sugar cane, in milk, and in most fruits, i. e. in a proportion rarely exceeding four to six per cent rather than in unlimited amounts of chemically isolated food principles like cane sugar.

The amount of sugar which one may eat without ill effects also depends much on whether one leads an active or a sedentary life. A man doing hard work or leading a very active outdoor life can readily assimilate without the least harm a quantity of sugar which would bring on severe dyspeptic symptoms in another engaged in a sedentary occupation and taking little exercise.

### SUGAR AND TEETH

There is no proof that the use of sugar is directly harmful to the teeth, certainly no more so than starch, which is much more apt to stick to or between the teeth and invite fermentation. At the same time, if saccharine substances in defiance of oral hygiene are allowed to remain long enough in contact with the teeth to set up fermentation, the acids produced thereby will undoubtedly attack the teeth and produce caries.

Many of the bad effects ascribed to sugar are due to the use of cane sugar and especially to a reckless use of cane sugar. It is questionable if cane sugar has all the bad effects ascribed to it by certain authors, but it has, quantity for quantity, undoubtedly a more irritating effect on the mucous membranes in the mouth, stomach, and bowels than maltose, lactose, honey, dextrose, or levulose, and should for this reason be taken in great moderation or the other sugars substituted.

### SUGAR IN DISEASE

While sugar is readily digested and absorbed in conditions of health, it is frequently a disturbing factor when partaken of during illness. This is largely due to the fact that in pathological conditions, especially those involving the digestive tract, digestive processes are carried on more slowly and the stomach fails to empty itself as promptly as in health, thus delaying the digestion and absorption of sugar and inviting abnormal fermentation with its series of troublesome symptoms. For this reason, sugar should be given in moderation or in dilute solutions as found in milk in cases of illness. The fact that during illness sweet foods are amongst the first to pall on the patient, makes this precaution doubly noteworthy. In my opinion the early and frequent rejection of sugar and other sweet foods



in illness is largely due to feeding sugar in excess, or to improper preparation and administration of the sweet foods.

Care should also be taken not to serve such preparations as malted milk or any of the plain malted foods intended to be added to milk in too concentrated a solution. By adding various flavors agreeable to the patient to the beverages mentioned, or serving them ice-cold or frozen, or by changing from cane sugar to maple sugar, maltose, lactose, or honey, sugar can be given so that it will be relished by most persons.

### SUGAR IN GASTRITIS

In gastritis, whether acute or chronic, as well as in gastroenteritis, there is more or less impairment of carbohydrate digestion and assimilation, with a tendency to fermentation, for which reason the ingestion of sugar should be restricted. In cases of flatulence both starches and sugar are best excluded. Milk, plain, or with lime water or Vichy water, is usually well borne. In the absence of flatulence, the starchy carbohydrates such as barley, rice, sago, and arrowroot, either in form of soups or gruels, are of special utility. The dextrinized and malted foods added to milk, or malted milk, provided they are not given in too strong a solution are also very useful. The same applies to stale bread, toast, crackers, zwieback, and similar foods properly fletcherized (i. e. thorough insalivation and mastication before swallowing). Hot, fresh bread and rolls and pancakes are to be avoided. Of the sugar family, maltose, honey, and lactose are best tolerated, but should be used in moderation and not in too concentrated a solution. Cane sugar is best avoided, as its use is attended by the secretion of more mucous and a more acid gastric juice and results in greater irritation of the mucous membrane of the stomach than is the case with some of the other sugars; cane sugar also remains in the stomach and intestines longer than maltose and dextrose before it is absorbed and is for this reason more liable to undergo fermentation and induce flatulence. In the language of Deeks: "In all uncomplicated stomach diseases, minimize the use of cane sugar in food in all forms."

### SUGAR IN GASTRIC ULCER

Milk, either plain, or what is better, diluted with lime water or barley water or rice water, or in the form of buttermilk constitutes not only a most rational diet in the early stages of gastric ulcer, but is the best form to administer sugar. Equally useful, and more agreeable to many patients, is the addition of dextrinized or malted foods to milk, or the use of malted milk, provided these foods are not given in too concentrated a form.

*(To be continued.)*

## THE USE OF TEA AND COFFEE AS DRINKS\*

BY J. M. FRENCH, M.D., MILFORD, MASS.

*The Universality of their Use:* Tea and coffee are the almost universal beverages of civilized man. So enormous are the quantities of each which are consumed every year, and so large is the proportion of people who use them, that it seems wise to spend a little time in studying their properties and uses, and in endeavoring to determine the effects of their habitual use upon the growth and development of the human system, and the orderly and harmonious performance of its various functions.

*The Tea of Commerce:* The tea of commerce, as employed for the purposes of a beverage, consists of the dried leaves of *Thea Chinensis*, an ever-green shrub which is native in eastern Asia, is largely cultivated in China and Japan, and is now being introduced into the southern parts of the United States. There are several varieties of this plant, among them *Thea viridis* or green tea, and *Thea bohea* or black tea. But the commercial terms, green and black tea, are not based upon this botanical distinction, but rather on their methods of preparation. The green teas of commerce are prepared by a preliminary exposure to the sun's rays until they have become thoroughly wilted, and a subsequent roasting and steaming; while the black teas are obtained by a process of fermentation, followed by drying and sifting. In some cases artificial coloring matter is used in the preparation of green teas. Both green and black teas are frequently subjected to adulteration during the various processes of manufacture. Among the grades of green tea most commonly used are Young Hyson, Imperial, and Gunpowder; and of black tea, Pekoe, Souchong, and Bohea. More than half of the tea used in the United States comes from China, and a large part of the remainder from Japan.

*The Coffee of Commerce:* The coffee of commerce consists of the ripened berries of the plant, *Coffea Arabica*, which is a native of Arabia Felix and Ethiopia, and is also extensively cultivated in Asia and America between the north and south latitudes of 56 degrees. Mocha coffee, which comes from Arabia, is considered the best, while Java comes next. But very little genuine Mocha coffee, however, reaches this country. It is estimated that from 63 to 75 per cent of the coffee consumed in the United States comes from Brazil, and the remainder largely from Jamaica and the other West India Islands. That from Brazil is known as Rio coffee.

In the preparation of coffee, the berries, or beans, are dried, roasted, and ground into a coarse powder before being made into a beverage. The agreeable aroma of coffee is developed almost entirely in the process of

\* An essay to which was given the Chase Wiggin prize of \$75 by the Rhode Island Medical Society, May 26, 1908.

roasting, and is due to the essential oils contained in the berries. Whole coffee is sometimes adulterated by adding the berries of inferior grades, or sometimes imitation berries made of clay and other substances. Ground coffee is more easily adulterated, by mixing with it roasted corn, peas, beans, oats, rye, and potatoes, and also dried dandelion root.

*The Constituents of Tea and Coffee:* The most important active constituent of tea is an alkaloid known as theine, and of coffee one known as caffeine. Chemically these two are said to be identical, and the caffeine of commerce is prepared both from the leaves of the tea plant and the berries or beans of the coffee plant, but more largely from the former. The leaves of the tea plant also contain a small quantity of a volatile oil to which it owes its peculiar aroma, from five to ten per cent of tannic acid, and small amounts of gallic acid and coloring matters. The chief active ingredients of raw coffee, aside from the caffeine, are caffeeo-tannic and caffeeic acids, but during the process of roasting there is developed a bitter principle and also an aromatic volatile oil, which together give to coffee its aroma and flavor.

*Caffeine (Theine) and its Effects:* Caffeine (theine) occurs in "fleecey masses of long, flexible white crystals, possessing a silky lustre, without color, having a bitter taste, and permanent in the air." Its principal action is that of a stimulant to the nervous system, producing a condition of wakefulness and unrest, with increased mental activity, rapidity of thought, clearness of reasoning, and power of prolonged and severe mental application. It stimulates the muscular fibres, lessens the sense of fatigue, and imparts an increased capacity for physical exertion. It elevates depressed temperature, causing a rise of from one to three degrees, according to the dose employed and the condition of the patient. It is eliminated from the system mainly through the kidneys, which it stimulates to increased activity. It is an agent of considerable value in medicine, its chief uses being summed up under the three heads of a cerebral stimulant, a cardiac stimulant, and a remedy for dropsy of cardiac origin.

While it is claimed that theine and caffeine are chemically identical, yet many clinical observers insist that there are considerable differences in their effects upon the system. Lewin claims that theine is less powerfully toxic than caffeine, requiring double the dose to produce the same effect. Mays asserts that theine acts principally on the motor nerves, and caffeine on the sensory, proving itself a valuable anaesthetic. Also that theine, at least in frogs, produces spasms and convulsions, while caffeine does not.

*The effects of Tea Drinking:* When taken in moderation, by adults of good digestion and not too sensitive nervous systems, tea acts as a mild stimulant with some astringent action, and is generally looked upon as a harmless and refreshing beverage. It is, however, by its action on the

young, the weak, and the sensitive, rather than on the strong and vigorous, that its effects as a whole are to be judged, and its desirability or otherwise as a beverage to be decided.

In invalids, especially where it is desirable to prevent sleep, tea is often very refreshing and effective. It is sometimes of value to relieve nausea and prevent vomiting. It also acts as a sedative to the heart and blood vessels. Thus far its action may be regarded as strictly medicinal. Liebig regards it as possessing considerable nutritive value. Green tea is more liable to derange the nerves than black. Its effects on the nerves are due to the essential oil and the theine, while the tannin which it contains causes it to act as an astringent. As green tea contains more tannic acid than black, it is also more likely to derange the digestive system and produce constipation.

It is generally agreed that both tea and coffee as drinks are injurious to children, and should never be indulged in by them. The same is true as to all young people, as at this period of life the nervous system is especially sensitive, and all stimulants should be avoided.

Haig regards tea as a great producer of uric acid, and claims that its stimulant effects are largely due to that fact. He believes that tea is not the simple and harmless substance that it is commonly supposed to be, and that in place of merely causing a little dyspepsia by tanning the mucous membranes of the stomach, it really brings about the introduction into the system of a large amount of uric acid. As an illustration of this fact, he calls attention to the results obtained by Dr. Morton of New York, who took from four to eight drams of green tea infused in a pint of water, and continued this for seven days, with the result that the uric acid rose steadily from five grains up to eight, ten, eleven, and thirteen grains, while the urea fell as steadily from 591 to 422 grains, this fall probably expressing the depressing effects on metabolism of the excess of xanthin or uric acid on the blood. In this respect tea is much more injurious than coffee.

*The Effects of Coffee Drinking:* The immediate effect of coffee when taken as a beverage is that of an agreeable stimulant, producing wakefulness and a free flow of thoughts aiding the process of digestion, increasing the flow of bile and the peristaltic movements of the intestines, thus favoring a free action of the bowels. When taken too freely, or used too strong, it produces very undesirable effects, among which are nervous irritability, low spirits, muscular weakness, and trembling, mental confusion, frequent and severe headaches, dizziness, and ringing in the ears. The effects upon the stomach are flatulence, acidity, heartburn, bitter, and sourish eructation of gas. When a person accustomed to the use of coffee as an aid to digestion omits his usual beverage, a headache will be the almost inevitable result. On the other hand, one of the most common results of the use of coffee, and especially its intemperate use, is habitual headache. Another

common result is insomnia, and most people find it unsafe to take coffee late in the day, owing to this tendency to induce wakefulness.

There is much difference of opinion as to the effects of coffee on metabolism, and the consequent waste of tissue, different experimenters reporting different results, and reaching diametrically opposite conclusions. So far as I have been able to ascertain, however, the weight of authority favors the statement that it does markedly lessen the waste of tissue, and my own experience also inclines me in this direction. I believe that many of the benefits and also of the evils of coffee drinking result directly from this property of lessening tissue-metamorphosis. By its aid one is enabled to live longer without food, and also by its use the waste products accumulate and become a source of poisoning to the system.

*Tea and Coffee, their Resemblances and Differences:* We have already seen that the effects of the two substances are similar in many respects. Roberts gives an analysis of the effects of tea and coffee on digestion, in which he finds very little difference in their action. Whatever differences there may be in their general effects, it is probable that they are due not so much to the caffeine or theine, as to the accessory substances contained in each, such as the volatile oils, the tannin of tea and the caffeic and caffeotannic acid of coffee, and some minor ingredients. Tea is more apt to produce indigestion and constipation, while coffee is more apt to induce headache, and more injurious to the eyes. Both induce wakefulness, but the character is different, that of the tea being more in the nature of an unpleasant or distressing insomnia, while that of coffee is more of a pleasant and dreamy character.

*Chronic Poisoning from Tea and Coffee, or Tea and Coffee Inebriety:* When large quantities of tea are drunk for a long time, the common results are dyspepsia, constipation, headache, nervousness, hysteria, palpitation, and other irregular action of the heart, neuralgic pains, difficulty of breathing, ringing in the ears, mental and physical exhaustion.

The excessive use of coffee produces a pallid or dusky skin, with emaciation, dull, and expressionless features, and a prematurely aged appearance. The pupils are dilated, the lips and tongue tremulous, sleep is disturbed or lost, the appetite is poor, and there is either constipation or diarrhea, more often the latter. The eyes and ears suffer more from coffee than from tobacco or alcohol. It does not absolutely destroy the sight or hearing, but brings on functional troubles of a very annoying character, which disappear when the use of coffee is discontinued.

Dr. Guelliott has reported twenty-three cases of chronic coffee-poisoning, seventeen of which were in women. Loss of appetite was found in eighteen cases, disturbances of sleep in sixteen, trembling of the lips and tongue in sixteen, leucorrhoea in twelve, gastralgia in eleven, dyspepsia in ten, neuralgia in ten, headaches in eight, vertigo and convulsive attacks in four, obstinate constipation in four, constipation alternating

with diarrhea in three. One woman in middle life kept her pocket full of coffee, of which she ate constantly. Her skin was of an earthy tint, she suffered from constipation, her sleep was irregular, and her mind was restless, anxious, and full of gloomy forebodings. She was much emaciated and both her nervous system and digestive organs suffered severely at times. Her lips and tongue were tremulous, dry, and cracked, her appetite was very irregular, and she was subject to vertigo, prolonged headache, and pains in the region of the stomach. She was cured in six months by abstinence from coffee and proper treatment.

Dr. Mandell, of Berlin, has published a clinical study of coffee inebriety, a disease which is spreading rapidly in Germany. He found large numbers of women who consumed over a pound of coffee a week, while some of the men drank considerably more than this, besides beer and wine. The leading symptoms were profound depression of spirits, with frequent headaches, and sleeplessness. A strong dose of coffee would relieve this for a time, then it would return. The muscles were weak and trembling, and the hands would tremble when at rest. The heart's action was rapid and irregular, and there were palpitations and a feeling of heaviness around the heart. The symptoms were relieved only by large doses of coffee, and so great was the suffering which was caused by even temporary abstinence, that the victims dared not abandon the habit for fear of death.

*A Personal Experience with Tea and Coffee Drinking:* The personal experience of the writer has been to some extent in line with the foregoing, and while not of the extreme type, has been sufficiently marked to convince him of the reality of the evil effects of tea and coffee drinking.

Up to the beginning of the year 1906, he had for more than twenty years been subject to frequent and severe headaches, of the type commonly known as nervous. During all of this time he had been a user of tea and coffee, and for a number of years had been in the habit of taking two and sometimes three cups of very strong coffee at breakfast, and sometimes tea or coffee at dinner also, with perhaps tea at night.

Meantime, his headaches grew worse instead of better. For a time they were relieved by a combination of acetanalid and caffeine, but finally even this lost its power. Being convinced that his headaches were due to uric acid, or at least to the retention of waste products in the system, he finally decided to stop the use of both tea and coffee, and to confine the amount of nitrogenous food taken within narrow limits. This he began to do about the last of January, 1906, at the same time cutting off most of the sugar which he had been in the habit of taking, and living on a light diet generally for a considerable time. After a few months, however, he went back to his former habits of diet in every respect with the exception of the use of tea and coffee. Of these he has drank none since that time, now about two years and three months. During this period he has suffered

far less from headaches than at any previous time for more than twenty years, having had but two or three severe attacks during the time. He therefore feels warranted in concluding that the principal cause of his former headaches was to be found in the tea and coffee which he drank, and that his later freedom comes from his abandonment of the habit.

*Summaries and Conclusions:* (1) Both tea and coffee are to a considerable extent medicines rather than foods. Used as such, they are of value in many conditions of disease, of weakness, of exhaustion, and in the infirmities of old age, as affording an agreeable stimulant, with the minimum of depression following.

(2) Used in moderate amounts as a beverage, they are often beneficial to hard working and vigorous adults, such as soldiers, sailors, and agricultural laborers, and others who live an active life, and are much out of doors; but they are likely to prove injurious to the young, the nervous, and impressionable, to many classes of brain workers, and to those who live a sedentary life indoors, and have a poor digestion.

(3) There is danger to all classes in the free use of these drinks. Very few persons can use them largely and habitually for a long period of years without receiving more or less injury from them. It is the safest plan for young people, and others who are especially susceptible, to let them entirely alone, and for all to make sure that they do not go beyond the bounds of the strictest moderation in their use.

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“Whoever is satisfied with what he does, has reached his culminating point — he will progress no more. Man’s destiny is to be not dissatisfied, but forever unsatisfied.”

“Better to strive and climb,  
And never reach the goal,  
Than to drift along with time —  
An aimless, worthless soul.  
Ay, better to climb and fall,  
Or sow, though the yield be small,  
Than to throw away day after day,  
And never strive at all.”

# EDITORIALS

## Journal of Therapeutics and Dietetics

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PITTS EDWIN HOWES, M.D., Treasurer

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PITTS EDWIN HOWES, M.D., EDITOR.

JOHN MARSHALL FRENCH, M.D., ASSOCIATE EDITOR.

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### OUR SECOND BIRTHDAY

WITH the next number (October) we begin the third year of our existence as the JOURNAL OF THERAPEUTICS AND DIETETICS. As we look back over the two past years of our labors we feel we have much to be thankful for, and that a bright future is in store for our publication.

As we celebrated our First Birthday by presenting our JOURNAL in a new dress, thus improving its appearance, so we are planning to rearrange and add to the various departments of our text pages as a second birthday present. This is being done with the desire to make our JOURNAL even a better help to the practitioner who desires to heal his patients.

One of the departments to be added will be headed *The Medical Round Table*. The pages of this department will be open to all the readers of our publication for the answers to any queries that may be sent us along the lines of Therapeutics (both medical and physical) and Dietetics. In order to make this of the greatest benefit to our readers it is necessary for all of them to take an interest in filling its pages. This they can do by sending questions to be solved or entering into the discussion of any question that has already appeared in preceding numbers. The only limitation we desire to place upon the subjects that are to be discussed around



this "Round Table" is that they must have reference to our two special features THERAPEUTICS AND DIETETICS.

To each of our numerous readers we wish to ask this question: Will you not aid and further this new feature by being represented in its discussions during the next twelve months?

We desire to commend to the attention of our readers the valuable information that is to be found among our advertising pages, and bespeak for them a careful perusal each month. It is our intention to allow only those articles which have intrinsic merit to find a place in our advertising space and thus we especially request all of our readers, whenever they correspond with any of our advertising patrons, to be sure and state the "Ad" was seen in the JOURNAL OF THERAPEUTICS AND DIETETICS. By so doing you will help the advertisers, the JOURNAL, and yourselves.

### THE PLACE OF CANNED GOODS IN THE FAMILY DIETARY

HOUSEKEEPERS of to-day often wonder how people used to plan before canned goods were known, for they must naturally feel that the family bill of fare would be robbed of much of its diversity and value, if these articles were to be excluded. But too many housekeepers fail to make the proper distinction between the various qualities of canned goods. As a result we find that the health of the household, instead of being benefited, is frequently endangered by the introduction of second-class and inferior articles along this line.

There is not the slightest excuse for any one to use any but the best brands of canned goods,—the best are always the cheapest in the long run,—for while the markets are fairly flooded with low-grade products, a little patience and a determination to accept none of the inferior kind, will result in securing the best in this line of food products.

THE JOURNAL OF THERAPEUTICS AND DIETETICS will aid in this crusade against inferiority and in calling attention to any brand which demonstrates superiority.

Such a product, for illustration, as Underwood's Original Deviled Ham, offered by William Underwood Company, of Boston, is eminently worthy of being considered an example of an absolutely pure and thoroughly wholesome article, and we do not hesitate to commend it to the careful housewife in the heartiest terms.

In making her purchases, the housekeeper should bear in mind that, as far as the health of the users is concerned, there are but two kinds of canned goods, viz. the very good and the very bad. Those of highest quality are healthful, while the low-grade products are, in their very nature, unwholesome. It is because we have found that Underwood's

Original Deviled Ham belongs to the former class that we bespeak for it the patronage of the intelligent housewife who regards the health of those under her care as of the first importance.

From the selection of the raw materials until the cans are labeled, the utmost attention and discrimination must be exercised in order that the finished product may successfully pass the examination of the scientific expert. The tests of the analytical laboratory are unerring and against the decision based upon such tests there is no appeal to a higher court.

If every publication which seeks to protect the health of its readers would investigate the quality of various food products, and where one of real value was found would call attention to it by name, much good would ensue. But, unfortunately, the press fear that those interested in the sale of food articles would receive a benefit from such endorsement. Our opinion is that this feature should not be considered, especially in those mediums which have for their objective point the curation and the prevention of abnormal conditions. Therefore in the interests of our readers and without regard to who it may incidentally benefit we are glad to bestow our heartiest commendation upon such a product as Underwood's Original Deviled Ham.

## THE TREATMENT OF CHOLERA MORBUS

WHEN I had been in practice but a short time, I came one summer upon what was almost an epidemic of cholera morbus. In that one season I had more cases of this disease than I have ever had in any half dozen since. They were of all degrees of severity, a large proportion of them quite severe, but all characterized by vomiting and purging, with more or less prostration.

The general plan of treatment which I made use of in the first cases consisted in the internal administration of such remedies as bismuth, pepsin, the alkalies, opiates, and stimulants; combined frequently with the use of mustard plasters and hot fomentations externally. As the stomach would retain nothing, my success was far from satisfactory, and I was led to seek for better means of meeting the attacks.

I next tried the rectal injection of starch and laudanum, thirty drops of laudanum being a medium dose. With this treatment I sometimes used some of the remedies previously mentioned. This plan was better than the first, but often the medicine was not retained, and had to be repeated one or more times. On the whole, it was not satisfactory.

The third method of treatment which I undertook was by means of the hypodermic injection of morphine, or morphine and atropine, one fourth grain of morphine being the average dose, and one fiftieth grain of

atropine if this was given. At first I usually gave the morphine alone, but later I came to give the two in combination. This method I found to be sure, safe, and satisfactory. I have used it in cases of all degrees of severity, and in all stages of the disease, from the man who had been struck down at his work with the suddenness of a shock, taken at the first attack of vomiting and purging, to the patient first seen in the third day of his suffering, in a condition of prostration approaching collapse — and always with success. Very seldom does the injection need to be repeated. If given early, it is often the only treatment needed. It may be theoretically objectionable, but it stands the proof at the bedside, which is the all important thing. Of course this treatment is not that which is recommended in the leading works on practice. One always has to go to a hustling brother practitioner or a live medical journal for the best things to use at the bedside. It is the men who are on the firing line who know how to treat conditions of disease.

My homeopathic neighbor tells me that the method which I have described is his most common treatment for cholera morbus.

The Eclectic Medical Journal for August, 1906, thus endorses it editorially: "Long before the doctor sees the patient, the stomach and bowels have thoroughly emptied themselves, so that what he has to do in the great majority of cases is to stop the vomiting and purging and give relief from pain first, and then relieve the irritation set up by the morbid elements. Now there is a slow way and a quick way to relieve this patient. You may sit by his bedside administering medicine by way of the mouth, and see him pass rapidly into collapse and maybe die, or you can set things right in thirty minutes. The best thing to be done, and therefore the first thing, is to administer a hypodermic injection of one fourth grain of morphine. This will usually give relief in from twenty to thirty minutes. The patient will stop vomiting and writhing, the bowels will cease to move, the pain will subside, and the patient will sleep. When he awakes, he will feel sore and tender over the abdomen. He should now have whatever remedy is indicated."

That excellent little work, Hughes' Compend of Practice, a book which is kept up to the times, begins his section on the treatment of cholera morbus thus: "At once, regardless of the cause, give a hypodermic injection of morphine sulph., grain one eighth to one third, to be repeated in half an hour if there is no improvement."

J. M. F.

## BOOK REVIEWS

*Hypnotic Therapeutics in Theory and Practice*, with numerous illustrations of Treatment by Suggestion, by JOHN DUNCAN QUACKENBOS, A.M.,

M.D., Author of "Hypnotism in Mental and Moral Culture," "Practical Physics," etc., Member of the London Society for Psychical Research; Fellow of the New York Academy of Medicine, etc. Cloth, pp. 326, \$2.00 net. Harper & Brothers, New York and London, 1908.

A great deal of genuine interest is being awakened in this and kindred subjects at the present time. This work will prove worthy of careful reading and much information can be gleaned from its pages to assist the practitioner to master that class of especially difficult cases. The author states in his preface that the work is based upon many thousand of his recent experiences and covering seven years of investigation. Such a statement should give him at least an impartial hearing.

*Golden Rules of Dietetics*, The General Principles and Empiric Knowledge of Human Nutrition; Analytic Tables of Foodstuffs; Diet Lists and Rules for Infant Feeding and for Feeding in Various Diseases. by A. L. BENEDICT, A.M., M.D., Member of American Academy of Medicine and of American Gastroenterological Association, etc., Author of "Practical Dietetics." Cloth, 12mo., pp. 407, \$3.00 net. C. V. Mosby Medical Book and Publishing Company, St. Louis, 1908.

This work will be a welcome addition to the increasing library on this subject which is so rapidly becoming prominent in medical thought. The following quotation from the author's preface gives an admirable presentation of what he has sought to accomplish. "The writer has endeavored to avoid purely scholastic scientific research which cannot be adapted to practical ends, and, on the other hand, the short-sighted so-called 'practical' method of presenting facts in an empiric manner without the scientific basis which alone enables a grasp of their true significance and a proper adjustment to individual requirements."

The careful reader of this work will admit that the work along these lines has been well done. The work merits a large sale and must prove of value to every one that consults its pages.

*The Baby, its Care and Development*, for the Use of Mothers, by L. GRAND KERR, M.D., Author of "Diagnostics of the Diseases of Children," Professor of the Diseases of Children in the Brooklyn Post-Graduate Medical School; Attending Physician to the Children's Department of the Methodist Episcopal (Seney) Hospital; Visiting Physician to the Children's Wards of the Williamsburg Hospital, and of the Swedish Hospital in Brooklyn, N. Y., etc. Cloth, 12mo., pp. 150, \$1.00 net. Albert T. Huntington, 1265 Bedford Avenue, Brooklyn, N. Y., 1908.

The writer of this little book has crowded into its pages a large amount of information that cannot help proving useful to prospective mothers both before and after the arrival of the little stranger. It is a book that can be placed in the hands of his families by the obstetrician with much benefit to all concerned. The book is deserving of a wide circulation, and will undoubtedly meet its just deserts.

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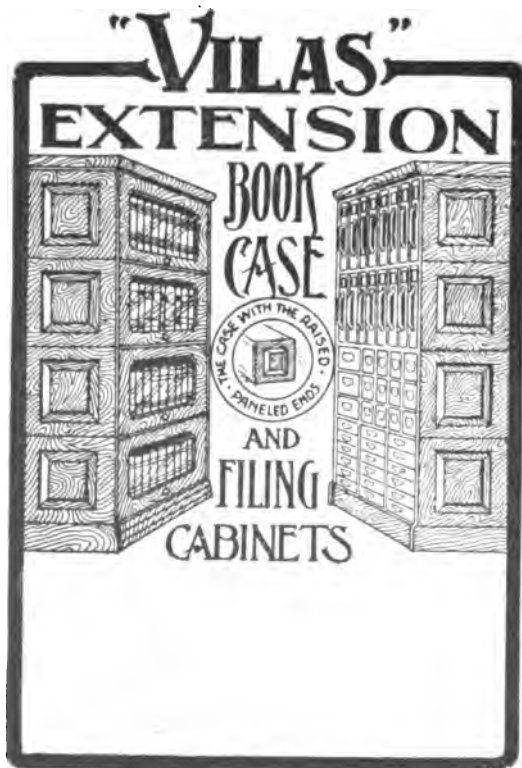
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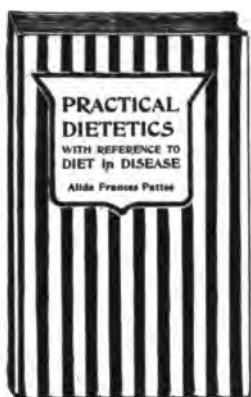
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SOME people can't tolerate a woollen shirt; notwithstanding this fact, nearly all babies are wrapped in flannel as soon as born, and for the itching it causes all sorts of things are suggested. The baby can't scratch, but it can wriggle and fret; this is interpreted as hunger. Why not? Everybody is hungry. It is forced to take nourishment, but as the nourishment will not stop the shirt from scratching, it continues to fret, and more food is forced; besides, it is shaken and rocked until it is in a frenzy of excitement, marked by crying. This is diagnosed as colic, and soothing syrup is given. If the child is not made an angel, the groundwork is laid for ill health, all due to itching brought on from woollen underclothing.

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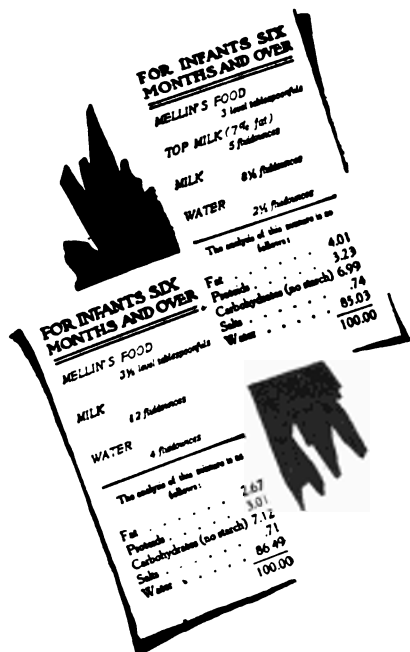
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### THERAPEUTIC AND DIETETIC NEWS—Continued.

seems indicated and desirable. Neurologists have called especial attention to this feature of the preparation Peacock's Bromides, and therefore, it is extensively prescribed and dispensed in epilepsy. This is the severest therapeutic test to which the Bromides can be put, and there is no doubt that purity is of great importance in such cases.

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